HARVARD SCHOOL OF PUBLIC HEALTH

ADVANCING THE PUBLIC'S HEALTH THROUGH LEARNING, DISCOVERY, AND COMMUNICATION

Catalog 2009–10

HARVARD SCHOOL OF PUBLIC HEALTH

Definition of Terms

Degrees

DPH	Doctor of public health
MOH	Master of occupational health
MPH	Master of public health
PhD	Doctor of philosophy
SD	Doctor of science
SM	Master of science

Diplomas for the MPH, DPH, and MOH degrees show the degree only. Diplomas for the SM and SD degrees also show the name of the department.

All PhD programs are offered under the aegis of the Harvard University Graduate School of Arts and Sciences.

Concentrations

The names of the departments generally convey their educational and research specialization, or *concentration*. Where several concentrations are available within a department, these are listed in the chart. In the Department of Environmental Health only, the concentrations are shown on diplomas. *Areas of interest*, described in this catalog but not listed in the chart, are generally less formal programs than concentrations or are subspecializations within them.

Departments and Degree Programs, 2009–10

Department of Biostatistics

SM (42.5-credit, 60-credit, and 80-credit programs), *PhD*

Department of Environmental Health

Exposure, epidemiology, and risk: *SM* (42.5-credit and 80-credit programs, including 80-credit program in occupational hygiene), *SD*

Molecular and integrative physiological sciences: *SD, PhD* (through the Division of Biological Sciences)

Occupational health (including joint programs with Simmons College): *MOH, SM* (42.5-credit and 80-credit programs), *SD, DPH*

Department of Epidemiology

SM (42.5-credit and 80-credit programs), *SD, DPH*

Department of Genetics and Complex Diseases

PhD (through the Division of Biological Sciences)

Department of Global Health and Population

SM (80-credit program), *SD, DPH*

Department of Health Policy and Management

SM (42.5-credit and 80-credit programs), *SD*

Health care management (part-time, nonresidential): *SM*

Health policy: *PhD* (through university program)

Department of Immunology and Infectious Diseases

SD, PhD (through the Division of Biological Sciences)

Department of Nutrition

Nutritional epidemiology, public health nutrition: *SD, DPH*

PhD (through the Division of Biological Sciences)

Department of Society, Human Development, and Health

(including joint programs with Simmons College)

SM (42.5-credit and 80-credit programs), *SD, DPH*

Health communication: *SM* (80-credit program), *SD, DPH*

Master of Public Health Program

Clinical effectiveness, family and community health, health care management and policy, international health, law and public health, occupational and environmental health, quantitative methods: *MPH*

Combined *MD-MPH*

Joint *JD-MPH* (for Harvard law students only)

Interdisciplinary Nondegree Programs

Interdisciplinary concentration in maternal and child health/children, youth, and families

Interdisciplinary concentration in obesity epidemiology and prevention

Interdisciplinary concentration in the epidemiology of infectious disease

Interdisciplinary concentration in women, gender, and health

Additional information on all programs, including course requirements and electives, is available at http://www.hsph.harvard.edu/academics.html.

CONTENTS

3 Letter from the Dean

4 Introduction to the Harvard School of Public Health

5 Degree Programs and Requirements

ACADEMIC DEPARTMENTS

6 Biostatistics

10 Environmental Health

18 Epidemiology

24 Genetics and Complex Diseases

26 Global Health and Population

32 Health Policy and Management

38 Immunology and Infectious Diseases

42 Nutrition

46 Society, Human Development, and Health

INTERDISCIPLINARY PROGRAMS

52 Master of Public Health Program

56 Division of Biological Sciences

57 Division of Public Health Practice

57 Interdisciplinary Concentration in Maternal and Child Health/Children, Youth, and Families

57 Interdisciplinary Concentration in Obesity Epidemiology and Prevention

58 Interdisciplinary Concentration in the Epidemiology of Infectious Disease

58 Interdisciplinary Concentration in Women, Gender, and Health

58 Research Centers

ACADEMIC SUMMER PROGRAMS

59 Summer Program in Clinical Effectiveness

59 Summer Session for Public Health Studies

ADMISSION AND ENROLLMENT

60 Admission to Degree Programs

61 Admission to Nondegree Status

62 Financial Aid

62 Registration

STUDENT LIFE

64 Boston, Massachusetts

64 Harvard University

64 Resources and Services for HSPH Students

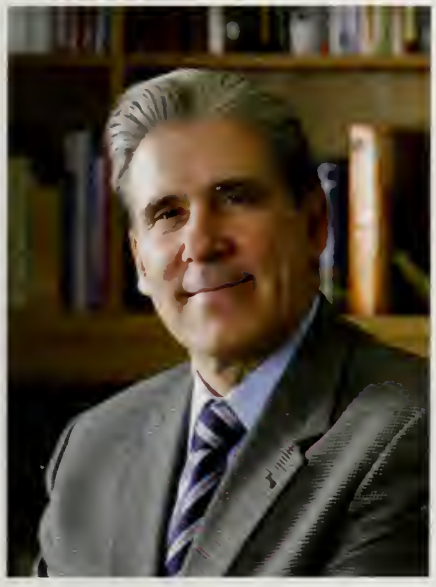
67 About the Catalog

68 Faculty Index

69 Academic Calendar

Cover: Associate Professor Michael VanRooyen, MD, MPH, and Jocelyn Kelly of the Harvard Humanitarian Initiative interview Mai Mai soldiers for a study of sexual violence against women in the Democratic Republic of the Congo. Photo: Justin Ide/Harvard News Office

FROM THE DEAN

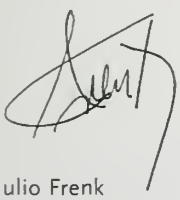


I am honored to have become the eighth dean of the Harvard School of Public Health, an institution with a venerable history of research and education spanning eighty-seven years, a brilliant faculty of interdisciplinary and collaborative problem solvers, students who bring their talents and their passion for public health here from all parts of the world, and a community of staff members who are guided by a strong sense of service. HSPH also has the good fortune to be part of a renowned university with extensive resources and activities devoted to the improvement of health.

But no institution can remain successful without embracing an agenda of permanent renewal. My own ambition for HSPH is that it should be the first school of public health for the twenty-first century: first in quality, first in its global reach and impact, and first in its ability to anticipate and innovate. In quality, the school is already a public health leader for the nation and the world. Its intellectual capacity ranges from the molecular biology of vaccines to the epidemiology of cancer; from women's and children's health to nutritional biochemistry; from health care management to human rights. Over the next few years, our goal for the school is to enforce our strengths by integrating disciplines and levels of analysis and by constantly assessing the excellence and relevance of our research and educational programs. Our strategy is to make major investments in the next generation—to identify and develop new opportunities for our students and our junior faculty. Our perspective is to see local and global health as a continuum; there are few problems in health, health policy, and health care that are not global.

We strive to provide the highest level of education for public health scientists, practitioners, and leaders. The departments and programs described in this catalog reflect the full scope of the public health enterprise and the expertise of our faculty, ranging across life sciences, quantitative methods, population-level analyses, and social and policy disciplines. All of our programs are approached with a deep sense of dedication on the part of the faculty, students, and staff and with a mutual respect for different ways of contributing to our shared purpose.

In the last century the impact of public health on the quality and duration of human lives was compelling, achieving longer gains in life expectancy than during the previously accumulated history of humankind. Please join us as we confront unfolding challenges to health and work together to discover solutions that will safeguard our global community.



Julio Frenk
Dean

THE HARVARD SCHOOL OF PUBLIC HEALTH (HSPH) IS A DIRECT DESCENDANT OF THE FIRST PROFESSIONAL TRAINING PROGRAM IN PUBLIC HEALTH IN AMERICA, THE HARVARD-MIT SCHOOL FOR HEALTH OFFICERS, A JOINT VENTURE THAT BEGAN IN 1913.

THE HARVARD SCHOOL OF PUBLIC HEALTH

IN 1922 HARVARD SPLIT OFF FROM MIT, and the Harvard School of Public Health was formally established. In 1946 the school celebrated its new status as a free-standing faculty of Harvard University, no longer an administrative part of the Medical School. Since its founding, the school, through its faculty and graduates, has been at the forefront of efforts to stem disease and promote health worldwide. During the early years the focus was on infectious diseases, deadly workplace exposures, and sanitation—from Alice Hamilton's pioneering studies of lead and mercury poisoning, to Thomas Weller's pathbreaking research on the polio virus and Philip Drinker's invention of the iron lung. More recently the school has expanded its reach to new areas, including the effects of race, gender, class, and social isolation on health; the reform of national health systems; and cutting-edge research on the biomarkers of disease.

Three Nobel Prizes, a Lasker Prize, four MacArthur Awards, presidential citations, and countless other honors attest to the excellence and impact of this work. Five successive HSPH alumni led the U.S. Centers for Disease Control and Prevention for an unprecedented twenty-seven years (1962–89). More difficult to quantify—but a far better gauge—are the perceptible gains in length and quality of life that have been realized through all these efforts.

The overarching mission of HSPH is to advance the public's health through learning, discovery, and communication. To achieve this mission, the Harvard School of Public Health has a faculty of almost four hundred members from the diverse fields and disciplines that constitute public health. The student body comprises over a thousand individuals from throughout the United States and sixty-two other countries. Students, like faculty members, come from an array of fields and include physicians, health services administrators, epidemiologists, nurses, dentists, lawyers, statisticians, environmental scientists, engineers, research assistants, psychologists, and social workers. About 35 percent of current HSPH students are enrolled in the interdisciplinary master of public health (MPH) program, 23 percent in master of science programs, and 42 percent in doctoral (doctor of science, doctor of public health, or doctor of philosophy) programs.

The school is organized into nine academic departments, the base of most teaching and research activity; two interdisciplinary divisions (Biological Sciences and Public Health Practice); the interdisciplinary master of public health program; and a number of specialized research centers. The school's academic programs are described in detail here in the catalog.

DEGREE PROGRAMS AND REQUIREMENTS

Degree Programs

The Harvard School of Public Health offers a number of degrees and degree programs (see inside front cover), reflecting a rich educational and research environment for students of many backgrounds and interests.

The degree programs have a range of purposes and requirements. Some master's programs are intended to prepare students for professional careers in public health; others focus on research training in preparation for doctoral study. The doctoral programs offered by HSPH (doctor of public health, doctor of science) are designed for students with interests in the scientific basis of public health and preventive medicine who wish to pursue academic or research positions. Students interested in the PhD programs in biostatistics and biological sciences in public health, sponsored by the Harvard University Graduate School of Arts and Sciences, may consult the relevant sections of this catalog.

Entrance Requirements

Entrance requirements for HSPH programs vary considerably by degree and also by department. Minimum entrance requirements for HSPH degree programs are as follows:

Master of occupational health Candidates must hold a doctoral degree in medicine.

Master of public health Candidates normally hold a doctoral degree—for example, MD, DO, DDS (or their non-U.S. equivalents), JD, PhD, SD, or other health-related degrees. Also eligible to apply are those with a master's degree in a health-related field (for example, MSN, MSW, MBA) and three years of relevant experience.

Master of science

42.5 credit SM Candidates normally hold a doctoral degree in medicine, dentistry, veterinary medicine, or other public health–related field. In some cases applicants with a master's degree in a related discipline or with significant professional experience may be considered.

80-credit SM Candidates must hold a bachelor's degree in a relevant field; some work experience may also be required.

60-credit SM in biostatistics Candidates normally hold a bachelor's degree in one of the mathematical sciences or an allied field (for example, biology, psychology, or economics).

Doctor of public health Candidates must have or be in progress toward an MPH degree and must also hold an advanced degree in a basic public health discipline.

Doctor of science Candidates must hold a bachelor's degree in a relevant field; some programs also require the completion of a prior master's or doctoral degree.

Schoolwide Degree Requirements

All HSPH degree programs require the completion of some course work intended to ensure basic competencies in public health sciences.

For all professional master's degree programs, students must fulfill core requirements in the following:

- biostatistics
- epidemiology
- environmental health sciences
- health services administration
- social and behavioral sciences

In addition, students must complete a culminating experience, demonstrating integration of public health knowledge, and/or a practice experience.

For research-oriented master's degree programs, students must fulfill the core requirements in biostatistics and epidemiology.

Students in HSPH doctoral programs must adhere to the doctoral timetable for maintaining satisfactory progress and must fulfill the following schoolwide requirements:

- completion of course work in one major field (20 credits) and two minor fields (10 credits each)

- completion of courses in introductory epidemiology and intermediate biostatistics
- completion of the schoolwide oral qualifying examination, usually by the end of the second year (some departments also require a written qualifying examination)
- completion of a program of independent and original research in one of the basic disciplines of public health
- the presentation and submission of this research in a dissertation and the public defense of the dissertation
- payment of at least two years of full-time tuition and one year of full-time reduced tuition

Prospective students should consult the descriptions in this catalog for more information about particular programs and their specific admission and degree requirements. The Student Handbook, available at www.hsph.harvard.edu/registrar, also provides detailed information about requirements, timetables, and procedures. Additional application and enrollment information can be found on pages 60–63.

Degree Planning

Prospective students may also consult degree planners available at each department's website. Degree planners are online tools that provide a sample course schedule for each of the concentrations or areas of interest offered by the school.

Department of BIOSTATISTICS

CENTER FOR BIOSTATISTICS IN AIDS RESEARCH

With about seventy-five biostatisticians and epidemiologists, the Center for Biostatistics in AIDS Research (CBAR) is responsible for the design, monitoring, and analysis of many federally funded clinical trials of the management of HIV and its complications in the United States, as well as for a number of international research efforts. "Because we have both adult and pediatric projects running side by side with important cross talk," says Janet Andersen, SD, CBAR executive director, "we are able to truly think about what happens to someone exposed to HIV or antiretroviral drugs, from in utero through adulthood."

One of CBAR's largest projects is doing statistical design and data analysis with the AIDS Clinical Trials Group, which runs hundreds of clinical studies on HIV care in adults. CBAR's other largest projects are the International Maternal Pediatric Adolescent AIDS Clinical Trials Group and the domestic Pediatric HIV/AIDS Cohort study. "These large groups are so important because it can take a study conducted at a single hospital a decade or more to get results," says Andersen. "We can do it quickly, with larger numbers, and with greater diversity of people across the world."

Statistical design can play a powerful role, she points out. CBAR statisticians have played pivotal roles in the design, analysis, and interpretation of trials that have had fundamental and rapid impact on national and international treatment management guidelines, including pinpointing when to initiate or switch treatment, identifying active drugs and drug combinations, and managing pregnant women with HIV around the world.

BIOSTATISTICS INVOLVES THE THEORY AND APPLICATION OF STATISTICAL SCIENCE TO ANALYZE PUBLIC HEALTH PROBLEMS AND TO FURTHER BIOMEDICAL RESEARCH.

THE FACULTY INCLUDES LEADERS IN THE development of statistical methods for clinical trials and observational studies, studies on the environment, and genomics/genetics. The department's research in statistical methods and interdisciplinary collaborations provide many opportunities for student participation.

Current departmental research on statistical and computing methods for observational studies and clinical trials includes survival analysis, missing-data problems, and causal inference. Other areas of investigation are environmental research (methods for longitudinal studies, analyses with incomplete data, and meta-analysis); statistical aspects of the study of AIDS and cancer; quantitative problems in health-risk analysis, technology assessment, and clinical decision making; statistical methodology in psychiatric research and in genetic studies; Bayesian statistics; statistical computing; statistical genetics and computational biology; and collaborative research activities with biomedical scientists in other Harvard-affiliated institutions.

Degree Programs in Biostatistics

As described below, the department offers 80-credit, 60-credit, and 42.5-credit master of science (SM) programs and a doctor of philosophy (PhD) program. The PhD is offered under the aegis of the Harvard University Graduate School of Arts and Sciences.

Detailed information about requirements and elective options can be found in a handbook distributed by the department. A master of public health program in quantitative methods is described in the interdisciplinary section of this catalog.

The programs offered by the Department of Biostatistics provide rigorous training in the development of methodology, collaboration, teaching, and consultation on a broad

spectrum of health-related problems. The department prepares students for academic and private-sector research careers. Recent graduates have assumed faculty posts at universities, as well as positions in research laboratories, federal government centers, pharmaceutical companies, and research institutes. The 60-credit master's degree program is designed to prepare students for applied research positions in hospitals and universities, research organizations, and the pharmaceutical and biotechnology industries.

Applicants to the department should have successfully completed calculus through multivariable integration and at least one semester of linear algebra and have knowledge of a programming language. In addition, applicants are strongly encouraged to have completed courses in probability, statistics, advanced calculus, and numerical analysis. Practical knowledge of a statistical computing package such as SAS, S-plus, R, Stata, or SPSS is also desirable.

Master of Science in Biostatistics (80-credit, 60-credit, and 42.5-credit programs)

The master's degree programs offered by the department are aimed at students seeking a terminal master's degree, although some students use the master's program as preparation for PhD studies. Students with strong backgrounds ultimately interested in a doctoral degree are encouraged to apply directly to the PhD program. For information about schoolwide requirements for master's degrees, see page 5.

RELATED OFFERINGS

Interdisciplinary concentration in the epidemiology of infectious disease, see page 58.
MPH concentration in quantitative methods, see page 55.

Biostatistics offers training in statistical theory and a variety of methods commonly used in the field of biostatistics. For the 80-credit program 50 credits must be earned in courses from the master's core, which includes probability, statistical inference, statistical methods, linear and logistic regression, survival analysis, longitudinal analysis, clinical trials, statistical genetics, computational biology, health decision sciences, and related areas. Students also choose from a variety of elective courses.

The 42.5-credit program is designed for students who have a master's degree in one of the mathematical sciences or a doctorate in a quantitative field. Applicants must have a mathematical and statistical background sufficient to achieve a level of proficiency after one year of study comparable to that attained in the 80-credit program. As courses must be taken out of sequence to complete the program in one year, considerable background in probability and statistical inference is needed. The requirements for this degree are essentially the same as for the 80-credit program. A minimum of 25 credits from the master's core must be completed, with courses chosen at an intermediate or advanced level. More flexibility is allowed since only 42.5 total credits are required. Other courses are selected in consultation with a faculty adviser.

The 60-credit program has an applied emphasis and is geared toward students with an undergraduate degree in one of the mathematical sciences or an allied field (for example, biology, psychology, or economics). A minimum of 40 credits of course work are required, including 30 credits from the applied biostatistics core curriculum and a minimum of 5 credits from elective courses. For the remaining credits students complete a collaborative research practicum related to the design, conduct, and analysis of research studies with a focus on data analysis and scientific presentation. Students then write a thesis and make an oral presentation based on the practicum.

Doctor of Philosophy in Biostatistics

The PhD program is designed for those who have demonstrated both interest and ability in scholarly research. Qualified applicants may apply to this program without a prior advanced degree. Please note that Graduate School of Arts and Sciences application forms must be used. The deadline for applying to the PhD program is December 15, 2009.

The course work for the PhD program is built on a 20-credit doctoral core. In addition, 35 credits of advanced biostatistics courses are required; these courses are chosen by the student in consultation with an adviser. Students must also complete a 10-credit cognate requirement (or minor) in a substantive area (such as the biology of cancer or AIDS). Given the increasing reliance of statistical practice on computing technology, one or more courses in statistical computing are also recommended. PhD students must satisfy a consulting requirement.

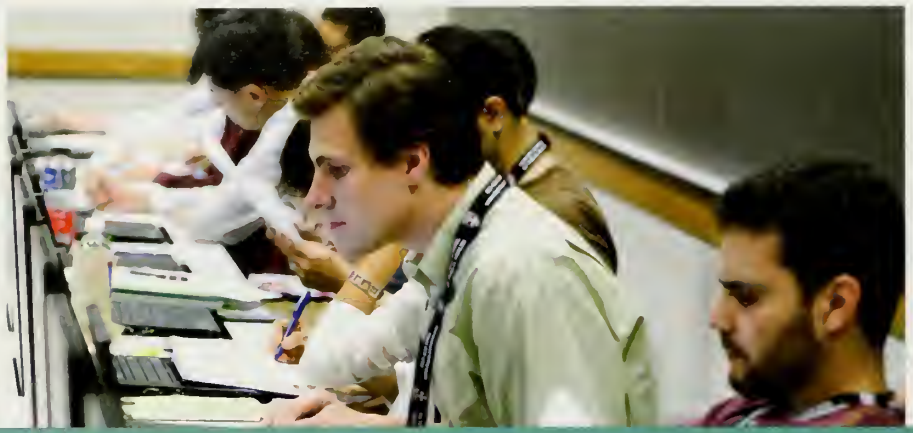
Funding is available to qualified students pursuing the PhD degree. Most of the funding is through six biostatistics training grants in AIDS, cancer, computational biology, the environment, neurostatistics, and public health training for underrepresented minorities. These traineeships require U.S. citizenship or permanent residency. Other funding (for example, tuition scholarships and teaching and research assistantships) is awarded on a competitive basis to qualified applicants, including international students.

Contact Information

For more information about research and training in biostatistics, please contact David Wypij, director of graduate studies, Department of Biostatistics, 655 Huntington Avenue, Boston, MA 02115, or visit the department website.
Phone: 617-432-1056
Fax: 617-432-5619
Email: biostat_admissions@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/biostatistics

For the PhD program online submissions are encouraged, using the Graduate School of Arts and Sciences (GSAS) application form available at the web address below:
Web: https://apply.embark.com/grad/Harvard/GSAS

For information on department funding, please consult http://hsph.harvard.edu/biostats/welcome/funding.html



For information on postdoctoral fellowships, please contact the Postdoctoral Committee, Department of Biostatistics, 655 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-1056
Fax: 617-432-5619
Email: biostat_postdoc@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/departments/biostatistics/fellowship-opportunities

DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2009–10.

Department Chair: Victor G. DeGruttola, SM, SM, SD; Professor of Biostatistics. Methods for clinical and epidemiological research on AIDS; investigation of causes and consequences of resistance to antiviral drugs; joint models of longitudinal and state changes processes.

Rebecca A. Betensky, PhD; Professor of Biostatistics. Survival analysis; cancer genetics; latent class models; genetic epidemiology.

Tianxi Cai, SD; Associate Professor of Biostatistics. Biomarker evaluation; high-dimensional data analysis; model selection and validation; personalized medicine in disease diagnosis, prognosis, and treatment; prediction methods; survival analysis.

Paul J. Catalano, SD; Senior Lecturer on Biostatistics. Repeated measures; multivariate models; dose-response modeling; risk assessment; environmental statistics.

COURSES OF INSTRUCTION

Please note that the courses listed are subject to change and some are not offered every year. Complete course descriptions are available at http://www.harvard.edu/registrar/courses.

Introduction to Programming in SAS
Introduction to Data Management and Programming in SAS
Principles of Biostatistics I and II
Introduction to Statistical Methods
Statistics for Medical Research—Introductory, II, Advanced, and Translational
Analysis of Rates and Proportions
Regression and Analysis of Variance in Experimental Research
Survey Research Methods in Community Health
Applied Regression for Clinical Research
Principles of Clinical Trials
Basics of Statistical Inference
Applied Survival Analysis
Survival Methods in Clinical Research
Applied Longitudinal Analysis
Fundamental Concepts in Gene-Mapping
Probability Theory and Applications I and II
Statistical Inference I and II
Methods I and II
Research Synthesis and Meta-Analysis of Public Health and Medicine
Regression and Analysis of Variance
Modern Statistical Computing Environments
Advanced Topics in Clinical Trials
Nonparametric Methods
Analysis of Failure Time Data
Analysis of Multivariate and Longitudinal Data
Design of Scientific Investigations
Advanced Statistical Computing
Bayesian Methods in Biostatistics
Advanced Statistical Genetics
Statistical Problems in Drug Development
Computational Methods for Categorical Data Analysis
Statistical Science Outreach
Sequential Analysis
Computational Biology
Spatial Statistics for Health Research and Social Inquiry
Public Health Surveillance
Semiparametric Methods for Analysis of Missing and Censored Data
Reading the Medical Literature: A Course for Statisticians
Statistical Methods for Causality
Linear and Longitudinal Regression
Introduction to Programming and Statistical Modeling in R
Introduction to Geographical Information Systems Using ArcGIS
Database Design and Usage for Health Research
Introductory Genomics and Bioinformatics for Health Research
Practice of Quantitative Methods
Computational Biology
Independent Study, Tutorials

Brent A. Coull, MS, PhD; Associate Professor of Biostatistics. Categorical data analysis; generalized linear mixed models; generalized additive models.

Francesca Dominici, PhD; Professor of Biostatistics. Bayesian statistics; statistical methods for environmental epidemiology; meta-analysis.

Robert J. Gray, MS, PhD; Professor of Biostatistics. Clinical trials; survival analysis.

David P. Harrington, MA, PhD; Professor of Biostatistics. Nonparametric methods for censored data; sequential designs for clinical trials; model fitting and prediction in nearly singular censored data regression models.

Winston Hide, MA, PhD; Associate Professor of Bioinformatics and Computational Biology. Stem cell gene regulation and cancer; computational biology and large-scale data integration; pathogen genomics.

Michael D. Hughes, MSc, PhD; Professor of Biostatistics. Statistical methods in the design, analysis, and reporting of clinical trials; meta-analyses and diagnostic testing.

Curtis Huttenhower, MS, MA, PhD; Assistant Professor of Bioinformatics and Computational Biology. Computational biology; functional genomics and data integration; biological network analysis.

Peter Kraft, MA, MS, PhD; Associate Professor of Epidemiology. Genetic epidemiology of complex diseases, especially cancer.

Stephen W. Lagakos, MPhil, PhD; Professor of Biostatistics. Statistical methods in AIDS research; clinical trials.

Nan M. Laird, PhD; Professor of Biostatistics. Longitudinal studies; nonresponse and missing-data methods; discrete data analysis; Bayesian methods.

Christoph Lange, MS, PhD; Associate Professor of Biostatistics. Statistical methods in genetics; generalized linear models; robust statistics; time series analysis.

Cheng Li, PhD; Associate Professor of Biostatistics. Computational biology with application interests in cancer and neuroscience; development of analysis methods and software for high-throughput gene expression and SNP microarray data.

Yi Li, MS, MS, PhD; Associate Professor of Biostatistics. Survival analysis; longitudinal and spatial data analysis.

Xihong Lin, MS, PhD; Professor of Biostatistics. Statistical methods for high-dimensional and correlated data; genomic and proteomic data in basic, population, and clinical sciences; longitudinal data, clustered data, hierarchical data, and spatial data.

Xiaole (Shirley) Liu, PhD; Associate Professor of Biostatistics. Computational genomics, especially sequence analysis; high throughput sequencing; genome tiling microarray analysis.

Judith J. Lok, MSc, PhD; Assistant Professor of Biostatistics. Causality; time-dependent confounding; counterfactuals; longitudinal data; observational studies; competing risks; HIV; survival analysis.

Donna S. Neuberg, MA, MS, SD; Senior Lecturer on Biostatistics. Cancer clinical trials; genetic epidemiology; high throughput data in cancer; laboratory and animal studies in cancer.

Marcello Pagano, MS, PhD; Professor of Statistical Computing. Surveillance; statistical computing; measurement in the developing world.

Giovanni Parmigiani, PhD; Professor of Biostatistics. Statistical methods in cancer genetics and genomics; medical decision making; Bayesian analysis.

Alkes L. Price, MSE, PhD; Assistant Professor of Statistical Genetics. Population genetics and its relevance to disease mapping.

John Quackenbush, MS, PhD; Professor of Computational Biology and Bioinformatics. Functional genomics; computational biology; mechanisms of cancer development and progression.

James M. Robins, MD; Mitchell L. and Robin LaFoley Dong Professor of Epidemiology. Analytic methods for drawing causal inferences in epidemiology and statistics.

Armin Schwartzman, MS, PhD; Assistant Professor of Biostatistics. Image and signal analysis; modern multivariate statistics; large-scale multiple testing; . functional and manifold-valued data; applications in cancer research.

Donna L. Spiegelman, SM, SD; Professor of Epidemiologic Methods. Statistical methods for epidemiologic research; measurement error and misclassification; global epidemiology.

Kenneth E. Stanley, AM, PhD; Lecturer on Biostatistics. Design and evaluation of randomized clinical trials.

Marcia A. Testa, MPH, MPhil, PhD; Senior Lecturer on Biostatistics. Measurement and analysis of patient-reported outcomes; statistical methods in drug development; evaluating public health preparedness.

Molin Wang, ME, PhD; Assistant Professor of Biostatistics. Estimation of functions; nuisance parameters; stratified, sparse, and clustered data; measurement of error.

James H. Ware, MS, PhD; Frederick Mosteller Professor of Biostatistics. Design and analysis of longitudinal studies.

Lee-Jen Wei, PhD; Professor of Biostatistics. Design and analysis of clinical trials; repeated measurements analysis; survival analysis.

Milton C. Weinstein, AM, MPP, PhD; Henry J. Kaiser Professor of Health Policy and Management. Medical decision science; cost-effectiveness analysis; health care technology assessment.

Paige L. Williams, MS, PhD; Senior Lecturer on Biostatistics. Design and analysis of HIV/AIDS clinical trials and observational studies; risk assessment; environmental statistics; environmental epidemiology; survival analysis; longitudinal analysis.

David Wypij, ScM, MS, MS, PhD; Senior Lecturer on Biostatistics. Longitudinal and repeated measures models; vaccine efficacy studies; clinical trials; applications in cardiology. psychiatry, and malaria.

Guocheng (GC) Yuan, PhD; Assistant Professor of Computational Biology and Bioinformatics. Computational biology; epigenomics; stem cells; DNA sequence analysis.

Marvin Zelen, MA, PhD; Lemuel Shattuck Research Professor of Statistical Science. Theory and practice of clinical trials; early detection of disease.

Secondary Appointments

(primary appointments at Harvard Medical School or Faculty of Arts and Sciences)

Roger B. Davis, MA, SD; Associate Professor in the Department of Biostatistics. Design and analysis of clinical trials; recursive partitioning methods.

Dianne M. Finkelstein, MS, PhD; Professor in the Department of Biostatistics. Survival analysis; clinical trials; epidemiology of cancer and AIDS.

Garrett Fitzmaurice, MSc, MA, SD; Professor in the Department of Biostatistics. Likelihood and nonlikelihood approaches to analyzing multivariate binary outcomes.

Kimberlee Gauvreau, SM, SD; Assistant Professor in the Department of Biostatistics. Biostatistical issues in clinical studies in pediatric cardiology; institutional variability in outcomes after congenital heart disease surgery.

Richard D. Gelber, MS, PhD; Professor in the Department of Biostatistics. Design and analysis of clinical trials.

Rebecca S. Gelman, PhD; Associate Professor in the Department of Biostatistics. Clinical trials; disease screening; survival methods.

Robert J. Glynn, MA, PhD, SM, SD; Associate Professor in the Department of Biostatistics. Analysis of longitudinal data; nonresponse in sample surveys.

Nicholas T. Lange, MS, SD; Associate Professor in the Department of Biostatistics. Statistical methodology for human and animal brain mapping.

Jun Liu, PhD; Professor in the Department of Biostatistics. Genetics; computational biology; missing data; Bayesian methodology.

Sharon-Lise T. Normand, MSc, PhD; Professor in the Department of Biostatistics. Bayesian inference; graphical models; meta-analysis.

E. John Orav, PhD; Associate Professor in the Department of Biostatistics. Statistical computing and simulation; stochastic modeling; bioassay.

Bernard A. Rosner, MA, PhD; Professor in the Department of Biostatistics. Analysis of clustered binary data; longitudinal data analysis.

David A. Schoenfeld, MA, PhD; Professor in the Department of Biostatistics. Statistics in medical research; gene arrays; survival theory.

Grace Wyshak, SM, PhD; Associate Professor in the Departments of Biostatistics and Global Health and Population. Global and national health, primarily women's health; cancer; osteoporosis; psychiatry; obstetrics; HIV/AIDS.

Adjunct Faculty

E. Andrés Houseman, SD. University of Massachusetts, Lowell.

Cyrus R. Mehta, SM, PhD. Cytel Software Corporation.

Alexander J. Ozonoff, MA, PhD. Boston University School of Public Health.

Christopher J. Paciorek, MS, PhD. University of California, Berkeley.

Andrea Rotnitzky, MA, PhD. Di Tella University, Argentina.

Louise M. Ryan, PhD. Commonwealth Scientific and Industrial Research Organisation, Australia.

Michael A. Stoto, AM, PhD. George Washington University.

Laura Forsberg White, SM, PhD. Boston University School of Public Health.

Department of ENVIRONMENTAL HEALTH

DANYA MACHNES

Master's student, Department of Environmental Health

"I've always been plagued by concerns about the world and whether it will still be livable when I have children," says Danya Machnes. "But I'm not an army. How do you make other people care?"

As a chemistry major at Vassar College, Danya got a taste for both bench research and education. For a science education internship she developed a curriculum and taught chemistry and photosynthesis to fourth graders. That experience made her realize how environmental factors like exposure to lead and other pollutants can affect children's health and their ability to learn. Her two years after graduation as a research technician at the Immune Disease Institute further piqued her interest in environmental factors, which can also contribute to autoimmune diseases.

Public health was a way to link what had previously seemed to be disconnected interests. "I didn't know what risk assessment was, and now it's what I want to do," says Danya, who received a fellowship from the school devoted to top master's degree applicants.

She is now interested in bridging risk assessment and management (the science of evaluating a risk and then making the most effective use of resources to control that risk) with the public policy and political will needed for change. Danya plans to apply to the HSPH doctoral program in environmental science and risk management and to use her training to inspire others to get involved. "Change can happen if people speak as one loud voice."

THE MISSION OF THE DEPARTMENT OF ENVIRONMENTAL HEALTH IS TO ADVANCE THE HEALTH OF ALL PEOPLE AROUND THE WORLD THROUGH RESEARCH AND TRAINING IN ENVIRONMENTAL HEALTH.

THE DEPARTMENT EMPHASIZES THE ROLE of air, water, the built environment, and the workplace as critical determinants of health. Faculty members in the department study the pathogenesis and prevention of environmentally produced illnesses and act as catalysts for scientifically based public health advances. Research approaches range from molecular studies to policy evaluation.

The Department of Environmental Health examines complex problems that require the contributions of many specialties. The department's faculty, research staff, and students reflect the multidisciplinary nature of the field and include chemists, engineers, epidemiologists, applied mathematicians, physicians, occupational health nurses, physiologists, cell biologists, molecular biologists, and microbiologists. Educational activities of the department are carried out through three concentrations:

- exposure, epidemiology, and risk
- occupational health
- molecular and integrative physiological sciences

EXPOSURE, EPIDEMIOLOGY, AND RISK

Research and educational training in exposure, epidemiology, and risk (EER) center on the investigation and mitigation of health risks associated with environmental and occupational hazards. These environmental challenges to our society are addressed by EER through an interdisciplinary approach, involving the characterization of contaminant sources, hazards, and environmental transport; identification of routes of exposure; investigation of health effects; and the employment of risk assessment, engineering, and management strategies to minimize adverse outcomes.

All students in EER acquire core competencies in each of the three domains in which faculty members focus their research:

- exposure assessment, which emphasizes the chemical, physical, microbiological, and engineering aspects of environmental and occupational exposures. Faculty members study the transport and fate of environmental contaminants by measurement and modeling of ambient, indoor, and personal exposures to environmental and workplace contaminants and hazards. They also develop instruments and methods for collecting, analyzing, and assessing the effects of physical, chemical, and biological stressors.

- epidemiology, which focuses on identifying and measuring the influence of environmental factors (physical, chemical, and biologic) on human disease in communities to provide scientific evidence for sound environmental and health policies.

- risk assessment, which integrates evidence from exposure assessment, epidemiology, toxicology, and other disciplines to inform policy decisions in the presence of uncertainty. Faculty members are involved in research and training on analytic methods and applications to quantify human health risks.

Beyond these core competencies students take additional courses to develop a focus in one or more of the areas of interest described below:

Environmental epidemiology This area of interest is for students interested in measuring the influence of environmental factors (physical, chemical, and biological) on human disease in communities to provide scientific evidence for sound environmental and health policies.

Ergonomics and safety This area of interest provides a public health and engineering approach to the prevention of work-related injuries and musculoskeletal disorders. The area encompasses exposure assessment, occupational biomechanics, and epidemiology.

Environmental exposure assessment This area of interest prepares students to identify and characterize human and ecological exposures to environmental contaminants, model their fate and transport, and develop strategies to control environmental hazards, allergens, and pathogens.

Occupational hygiene This area of interest offers training in the anticipation, identification, evaluation, and control of occupational hazards.

Risk and decision sciences This area of interest provides an integrated education in environmental science, risk analysis, and decision science applied to environmental management.

Degree Programs in Exposure, Epidemiology, and Risk

EER offers both 80-credit and 42.5-credit master of science (SM) programs in environmental health, including the 80-credit SM in occupational hygiene, as well as a program leading to the doctor of science (SD) degree.

All students must meet the school requirements for core knowledge in public health (for information about schoolwide requirements for master's and doctoral students, see page 5). In addition, both doctoral and master's students in this concentration take core courses in human physiology and toxicology, exposure assessment, environmental and occupational epidemiology, and risk assessment. Beyond the general core requirements, areas of interest have specific course requirements. Advanced courses in exposure, epidemiology, and risk are oriented toward specific pollutants or media (such as air or water). They may focus on monitoring, modeling, or controlling pollutants; health effects; or management, regulation, and policy.

Many students also take courses at MIT and at other Harvard schools, including the Kennedy School and the Graduate School of Arts and Sciences.

Master of Science in Environmental Health (80-credit and 42.5-credit programs)

Graduates of these professional programs assume positions in government, in private companies, or in research institutions. In the past few years some graduates have gone to work as scientists in environmental consulting firms, as occupational hygienists, or as academic and government researchers. Some are working for nonprofit community and international organizations, while others have gone on to pursue doctoral programs.

Applicants' personal statements should clearly state their preferred area of interest within the exposure, epidemiology, and risk concentration and the ways that the program will further their careers.

Applicants to the 80-credit program generally have undergraduate degrees and limited work experience. Consistent with the interdisciplinary nature of the concentration, a broad range of undergraduate or graduate degrees are acceptable. Among these are environmental science, physics, mathematics, biology, chemistry, engineer-

ing, geology, meteorology, and decision analysis. Applicants to the program are expected to have evidence of strong quantitative skills. Occasionally applicants with social science, business, or policy backgrounds are successful if they can demonstrate some academic background in math, chemistry, physics, and biology. At times applicants are accepted conditional upon completing science and/or math courses.

The EER 80-credit master's programs are based on a set of core courses in the first two semesters, followed by more specialized courses in the later semesters. Within these constraints students have some flexibility to change their focus within the program. Students enrolled in the 80-credit program in occupational hygiene follow the same general curriculum and may also elect a focus on hazardous substances, which involves additional targeted courses and a related project.

Applicants with exceptional credentials (including postbaccalaureate degrees and/or professional experience) may request consideration for admission to a 42.5-credit SM program.

Within the 42.5-credit master's program an area of interest in environmental health management is available for midcareer environmental health professionals from developing countries interested in updating and strengthening their knowledge and technical capabilities. The program stresses the scientific foundations and quantitative/analytic skills needed to frame, develop, and manage environmental health policy. Topics of study include exposure and risk assessment, epidemiology and toxicology, environmental economics and decision analysis, life-cycle assessment, and negotiation analysis.

Doctor of Science in Environmental Health

Doctoral graduates are qualified for research and teaching positions in schools of public health and other academic institutions, in local and federal agencies, and in the private sector. Recent graduates have taken positions as faculty members; as research scientists with the Environmental Protection Agency, the National Institute for Occupational Safety and Health (NIOSH), the environmental division of Health Canada, and Taiwan's Institute of Occupational Health and Safety; and as staff scientists with the National Research Council, the Mexican Ministry of Health, and consulting organizations.

Applicants to the doctoral program normally have a master's degree in a related science or mathematics field and strong scientific and quantitative skills. Admission into the doctoral program in all areas of interest depends upon demonstrated competence in the requirements for an SM program described above. Those applying to study occupational hygiene usually have several years of relevant work experience in addition to a master's degree.

Doctoral students interested in a research career in environmental epidemiology are encouraged to consider a dual degree in environmental health and epidemiology (see page 19). Doctoral students with a strong interest in both environmental science and methodological aspects of the decision sciences are encouraged to apply to the environmental science and risk management area of interest. This program involves admission to both the Department of Environmental Health and the Department of Health Policy and Management and requires a double major. Students uncertain about whether their interests are better suited to one of these joint programs or to another program in exposure, epidemiology, and risk should contact the EER office for clarification.

Doctoral candidates serve as teaching assistants and are provided training in proposal development and oral presentation. They are also given the opportunity to present their research in departmental seminars. During the course of their program, doctoral students are encouraged to present papers at scientific conferences.

Depending on the specialty area, doctoral students may be funded either fully or partially through research or training-grant fellowships. National Institutes of Health (NIH) traineeships are restricted to doctoral students who are U.S. citizens or permanent residents. For students specializing in occupational hygiene, tuition support may be available through a NIOSH Education and Research Center Grant for highly qualified U.S. citizens and permanent residents.

Contact Information

For more information about research and training in exposure, epidemiology, and risk, please contact the EER Program Office at HSPH Landmark Center, Box 15677, 401 Park Drive West, Boston, MA 02215, or visit the EER website.

Applicants to the doctoral program are strongly encouraged to arrange an interview with faculty members. Please contact the EER program office at the address above or via email.
Email: envsci@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/eer

OCCUPATIONAL HEALTH

This occupational health concentration is designed to train health and safety professionals to recognize and prevent disease and injuries associated with occupational and environmental exposures. This concentration is offered by the environmental and occupational medicine and epidemiology

program (EOME). The disciplines of medicine and epidemiology are the focus of the EOME program; depending on the orientation of the student, these disciplines are brought to bear on occupationally and environmentally related exposures. Practicing physicians and nurses can choose courses with a medical orientation; industrial hygienists, safety professionals, and those seeking careers in academia and research can emphasize epidemiology. The academic degree programs described below are organized so that students can chose courses in both medicine and epidemiology.

Faculty research is focused on a wide variety of exposures and research approaches to identifying the association between exposure and disease or injury. Areas of faculty research include the following:

- respiratory disease among exposed populations, including indoor and outdoor workers and building occupants
- reproductive and chronic disease studies of populations exposed to petrochemicals, heavy metals, and persistent organic compounds
- biological and chemical hazards assessment
- epidemiology of acute injury and cumulative trauma disorders
- occupational and environmental cancers, such as lung, skin, and bladder cancer
- biomonitoring and medical surveillance
- occupational and environmental health focused on developing countries
- occupational health policy and services
- environmental genetics, including the development of biochemical, molecular, and genetic markers and their applications in environmental epidemiologic studies
- gene-environment interactions
- environmental and molecular epidemiology and occupational epidemiology

Degree Programs in Occupational Health

The training programs in occupational health are offered through the NIOSH-sponsored Harvard Education and Research Center for Occupational Safety and Health (ERC). Graduates are prepared for careers in fields such as occupational and environmental medicine and nursing, occupational hygiene, occupational and/or environmental safety, epidemiologic research, disease and injury surveillance, environmental and/or occupational health policy, and molecular epidemiology.

As described below, the following programs are offered: master of occupational health (MOH); master of science (SM) in primary health care nursing (from Simmons College) and dual-degree SM in environmental health and primary health care nursing (from HSPH, in cooperation with Simmons College); SM in environmental health with a focus on occupational safety and health; and doctor of science (SD) or doctor of public health (DPH). For information about schoolwide requirements for master's and doctoral degrees, see page 5.

Master of Occupational Health (42.5-credit program)

This professional program is designed to train physicians in the public health disciplines relevant to the prevention and control of occupational and environmental disease and injury. Physicians interested in occupational and environmental medicine may apply either to the MOH program or to the occupational and environmental health concentration of the master of public health (MPH) program. Either the MOH or the MPH is taken as the first year of a two-year Occupational and Environmental Medicine Residency (see page 14).

For the MOH (or the MPH) program, in addition to schoolwide requirements, students take core courses in toxicology, ergonomics and human factors, occupational safety, occupational health policy and administration, the work environment, occupational and environmental medicine, environmental and occupational epidemiology, and the practice of occupational health. Recommended electives include the analysis of rates and proportions, regression and analysis of variance in experimental research, and the ethical basis of the practice of public health.

Master of Science in Environmental Health (80-credit and 42.5-credit programs)

The occupational health concentration emphasizes the epidemiologic and biostatistical aspects of the environmental and occupational fields. The SM is normally an

80-credit program, although an individual with a PhD or JD may be admitted to a 42.5-credit program. It is generally expected that students without a prior doctoral degree will wish to enroll in a subsequent doctoral program.

This program provides training appropriate for those who wish to work in research or teaching environments. Applicants normally have a bachelor's degree and advanced training in science, including college-level organic and inorganic chemistry. Those currently holding positions in the fields of occupational or environmental safety and health, and planning to return to these positions, are considered particularly strong candidates for admission.

In addition to schoolwide requirements, students take courses in toxicology, pathophysiology, ergonomics and human factors, occupational safety, occupational health policy and administration, the work environment, environmental and occupational epidemiology, the practice of occupational health, advanced biostatistics, and ethics.

Master of Science in Primary Health Care Nursing (42.5-credit program)

This program is offered by the Harvard Education and Research Center and Simmons College, which awards the degree. The program is designed for registered nurses seeking preparation as occupational health nurse practitioners.

Applicants must have at least a bachelor's degree in nursing from a program accredited by the National League of Nursing, must show satisfactory completion of basic statistics and physical assessment courses, and must be registered to practice nursing in a U.S. state or territory.

Participants undertake practica in industrial settings, clinics, and hospital-based occupational health programs and complete a course at HSPH in occupational health policy and administration and courses at Simmons College in normal and abnormal human physiology, research methods, the theory and practice of primary health care nursing, the theoretical foundations for nursing practice, clinical pharmacology for nurses in ambulatory care, health in the workplace, health care systems, and health promotion.

Master of Science in Environmental Health (HSPH) and Primary Health Care Nursing (Simmons College) (dual-degree, 74-credit program)

This dual-degree professional program emphasizes identification of health hazards, workplace assessment, program planning and intervention, worker health promotion, and disease and injury prevention. The program integrates curricula from HSPH and Simmons College, with courses taken concurrently at these institutions.

The program focusing on occupational health nursing is aimed at preparing nurses for positions as occupational health nurse practitioners. Practice locations include workplaces/corporations, clinics (including occupational and environmental medicine facilities), and hospitals.

Applicants must have at least a bachelor's degree in nursing from a program accredited by the National League of Nursing or the Commission on Collegiate Nursing Education, must show satisfactory completion of a basic statistics course, and must be registered to practice nursing in a U.S. state or territory. Nurses interested in this program must apply to, be accepted by, and maintain satisfactory academic progress in both schools.

Students in this program must fulfill essentially the same course requirements at Simmons College as those enrolled in the master of science in primary health care nursing. At HSPH, in addition to schoolwide requirements, students take courses covering ergonomics and human factors, the work environment, occupational safety, and environmental and occupational epidemiology; a tutorial in toxicology; and two electives. Students must also complete an independent study project.

Doctor of Science in Environmental Health/Doctor of Public Health

The SD or DPH degree may be earned by students who wish to concentrate in disciplines related to occupational health, including injury prevention, occupational epidemiology, or environmental molecular epidemiology. Applicants for the DPH program must have or be in progress toward, an MPH degree and must also hold an advanced degree in a basic public health discipline.

In addition to schoolwide requirements, students in the doctoral program complete many of the same courses as those in the SM program and also courses in exposure assessment for epidemiology, biomarkers in chronic disease, genetics, and advanced epidemiology.

Some financial support may be available for doctoral students who are U.S. citizens or permanent residents through NIH National Research Service Awards, NIOSH-sponsored ERC (Education and Research Center) or other traineeships, or scholarships.

Occupational and Environmental Medicine Residency

The Occupational and Environmental Medicine Residency (OEMR) is a two-year program consisting of an academic year leading to the MPH or MOH degree and a practicum year devoted to the development of skills in clinical occupational and environmental medicine and epidemiologic research. During the practicum year acquired knowledge and skills are applied to patient management and workplace/community problem solving; at least one short-term research project is designed, executed, and documented under faculty supervision. Field experience includes rotations through hospital- and community-based occupational and environmental health clinics. Additional rotation choices are available in corporate medical departments and governmental agencies. The residency is fully accredited by the Accreditation Council for Graduate Medical Education.

Applicants must be graduates of an approved school of medicine or osteopathy and must have completed at least one year of internship training in an accredited U.S. or Canadian clinical program; board eligibility or certification in a primary care specialty is preferred. Physicians currently holding positions in the field of occupational safety and health who plan to return to these positions are considered strong candidates for admission.

Admission to the practicum year of the residency is a separate process from, and usually occurs shortly after, admission to the degree program. In addition to submitting an electronic application to the (MPH or MOH) degree program, prospective residents must apply to the practicum year

COURSES OF INSTRUCTION

Please note that the courses listed are subject to change and some are not offered every year. Complete course descriptions are available at http://www.hsph.harvard.edu/registrar/courses.

Introduction to Environmental Health
Principles of Environmental Health
Human Physiology
Pathophysiology of Human Disease
Advanced Respiratory Physiology
Advanced Topics in Physiology
Occupational Health Policy and Administration
Introduction to Occupational and Environmental Medicine
Epidemiology of Environmental and Occupational Health Regulations
Occupational Safety and Injury Prevention
Ergonomics/Human Factors
Protecting Workers and Communities from Hazardous Substances
Ventilation
Evaluation and Control of Noise and Vibration
Introduction to Aerobiology
Water Pollution
Introduction to the Work Environment
Analytical Methods and Exposure Assessment
Water Systems Management
Industrial Hygiene/Ergonomics Internships and Environmental Sciences Research Seminar
Exposure Assessment for Environmental and Occupational Epidemiology
Environment Risk Management
Genetic Epidemiology and Gene-Mapping
Human Health and Global Environmental Change
Radiation Environment: Identification, Evaluation, and Control
Field Methods in Environmental Health
Occupational Health Care Delivery
Injury Epidemiology and Prevention
Industrial Ecology and Life Cycle Assessment
Research in Physiology
Properties and Behavior of Airborne Particles
Occupational Biomechanics
Atmospheric Environment Seminars
Environmental Epigenetics
Principles of Toxicology
Advanced Seminar in Aerobiology
Environmental Exposure, Epidemiology, and Risk Practicum
Fundamentals of Human Environmental Exposure Assessment
Interdisciplinary Training in Pulmonary-Sciences I and II
Critical Readings in Mechanisms of Health Effects by Air Pollution
Environmental Genetics
Ecotoxicology
Air Pollution Modeling
Research Design in Environmental Health
Environmental and Occupational Epidemiology
Practice of Occupational Health
Respiratory Epidemiology
Advanced Regression for Environmental Epidemiology
Integrated Cancer Biology
Environmental Cardiology
Risk Assessment
Independent Research, Tutorials

RELATED OFFERINGS

Environmental/occupational epidemiology area of interest, Department of Epidemiology, see page 19.
MPH concentration in occupational and environmental health, see page 55.

through the Electronic Residency Application Service. OEMR encourages prospective residents to send a curriculum vitae listing medical training and experience, research experience, and publications to the program director prior to beginning the application process. Prospective residents who already have an MPH degree are welcome to apply and should consult the OEMR website.

Applicants to the MOH program and the MPH program with a concentration in occupational and environmental health who are also applying to the Occupational and Environmental Medicine Residency program must apply for both the degree program and the residency by October 15, 2009, for 2010–11 matriculation. Continuation into the second year of the residency is contingent upon having had adequate prior clinical experience and exemplary performance in the academic phase of the program.

Some financial support for residency candidates who are U.S. citizens or permanent residents may be available through traineeships.

Contact Information

For more information about the occupational health concentration, MOH degree program, training in occupational epidemiology and environmental molecular epidemiology, and ERC traineeships, please contact David Christiani, MD, MPH, SM, Department of Environmental Health, 665 Huntington Avenue, Boston, MA 02115, or visit the ERC website.
Phone: 617-432-1260
Fax. 617-432-3441
Email: dchris@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/erc

For more information about the Occupational and Environmental Medicine Residency, please contact Stefanos Kales, MD, MPH, Department of Environmental Health, 665 Huntington Avenue, Boston, MA 02115.
Phone: 617-665-1580
Fax: 617-432-0219
Email: skales@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/erc/oemr/index.htm

MOLECULAR AND INTEGRATIVE PHYSIOLOGICAL SCIENCES

Training in molecular and integrative physiological sciences (MIPS) addresses the intersection between basic pulmonary sciences and environmental exposures, often in the context of global public health. Faculty members focus on three main prob-

lems: air pollution, lung infection, and asthma. The theme of pulmonary inflammation spans these foci, as does an interdisciplinary approach bridging biological and physical sciences. Areas of research include biomechanical properties of cells/tissue in normal/inflamed lungs; smooth muscle and airway constriction in asthma; mediators and adhesion molecules involved in pulmonary inflammation; effects of inhaled particles; lung infections; genomic discovery approaches to cell biology; and epithelial cell, macrophage, lymphocyte, and neutrophil lung biology. The biology is broadly based, ranging from molecular and cell biology to integrated organismic, environmental, and comparative physiology.

The MIPS concentration combines a range of scientific fields, including physics, bioengineering, physiology, biomathematics, cell biology, molecular biology, proteomics and genomics, clinical science, and epidemiology. By working within this rich interdisciplinary environment, students learn many measurement technologies, discover a variety of approaches, and develop mature scientific thinking.

Degree Programs in Molecular and Integrative Physiological Sciences

As described below, the MIPS concentration leads either to the doctor of science (SD) degree, offered through the Department of Environmental Health, or to the doctor of philosophy (PhD) degree, offered through the Division of Biological Sciences.

Doctor of Science in Environmental Health

Students wishing to study cellular, integrative, or engineering approaches as they pertain to problems in the environment, physiology, or public health may apply directly to the SD program in the Department of Environmental Health.

The SD program prepares students for research careers in respiratory physiology, cell and molecular biology, or bioengineering. Graduates assume positions as faculty members and research scientists at medical schools, research institutes, and schools of public health. Career opportunities in molecular and integrative physiological sciences as they apply to public health are expected to grow both in academia and in the biotechnology and pharmaceutical industries.

Applicants to the program generally have a bachelor's degree and demonstrated competence in organic and biological chemistry, general biology, physics, and calculus. Students in this program follow a different curriculum from those in the PhD program. In consultation with their adviser, students design a program of course work with their specific objectives in mind. The program offers a firm foundation in the basic biomedical sciences, as well as in epidemiology and biostatistics, and provides the opportunity for students to engage in laboratory rotations. For information about schoolwide requirements for doctoral degrees, see page 5.

Most students admitted to the SD program receive a stipend, as well as tuition and health insurance support. Students are encouraged to apply for fellowships from outside sources since certain external fellowships provide higher stipends.

Doctor of Philosophy in Biological Sciences in Public Health (Molecular and Integrative Physiological Sciences)

Students wishing to study cellular and molecular biology or physiology as it pertains to major problems in public health may apply to the PhD program offered by the Division of Biological Sciences through the Harvard University Graduate School of Arts and Sciences. The PhD program is designed to prepare students for research careers in respiratory physiology, cell and molecular biology, or bioengineering. For more information about the PhD program, see page 56.

Contact Information

For more information about research and training in molecular and integrative physiological sciences or about the SD program, please contact Lester Kobzik, MD, Department of Environmental Health, 665 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-2247
Fax: 617-432-0014
Email: lkobzik@hsph.harvard.edu

For the PhD Program in Biological Sciences in Public Health, online submissions are encouraged, using the Graduate School of Arts and Sciences (GSAS) application form available at the web address below:
Web: http://www.gsas.harvard.edu/hils/admissions_apply.html

DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2009–10.

Department chair: Douglas W. Dockery, SM, SM, SD; Professor of Environmental Epidemiology. Epidemiologic studies of respiratory health effects of air pollution; environmental exposures and lifetime development of respiratory disease.

Joseph D. Brain, SM, SM, SD; Cecil K. and Philip Drinker Professor of Environmental Physiology. Function and structure of pulmonary macrophages; deposition and clearance of inhaled particles and responses to them; respiratory infection; metal bioavailability.

John Briscoe, PhD; Gordon McKay Professor of the Practice of Environmental Engineering and Professor of the Practice of Environmental Health. Water management, economic development, and health.

James P. Butler, AM, PhD; Senior Lecturer on Physiology. Cell mechanics; soft-tissue lubrication; pulmonary functional imaging with hyperpolarized noble gas MRI; gait kinematics and risk of falling; aerosol transport and deposition mechanisms.

David C. Christiani, MD, MPH, SM; Professor of Occupational Medicine and Epidemiology. Environmental and occupational molecular epidemiology; gene-environment interactions; environmental genetics.

Philip K. Demokritou, MEng, PhD; Assistant Professor of Aerosol Physics. Aerosol science and technology; indoor environmental quality.

Jack T. Dennerlein, SM, PhD; Associate Professor of Ergonomics and Safety. Upper-extremity biomechanics during keying; tools in exposure assessment of physical risk factors of VDT workers; product design's effect on upper-extremity biomechanics; prevention of falls from ladders.

John S. Evans, MS, SM, SD; Senior Lecturer on Environmental Science. Risk and decision analysis; characterization of uncertainty; value of information; environment and health in the Middle East; public health impacts of the 1990 invasion and occupation of Kuwait.

Majid Ezzati, MEng, MA, PhD; Associate Professor of International Health. Environmental health in developing countries; energy, air pollution, and health; risk assessment; population health; global health; technology policy.

Jeffrey J. Fredberg, SMME, ME, PhD; Professor of Bioengineering and Physiology. Biophysical properties of cells and their relationship to airway narrowing in asthma.

Russ B. Hauser, MD, MPH, SD; Professor of Environmental and Occupational Epidemiology. Reproductive and developmental epidemiology; impact of endocrine disruptors on fertility and pregnancy outcomes; contaminants.

Robert F. Herrick, MS, SD; Senior Lecturer on Occupational Hygiene. Exposure assessment; exposure-biomarker relationships; control technologies and intervention strategies.

Petros Koutrakis, MS, PhD; Professor of Environmental Sciences. Air pollution; indoor air quality; air pollution exposure assessment.

Francine Laden, MS, SD; Mark and Catherine Winkler Associate Professor of Environmental Epidemiology. Environmental risk factors for chronic diseases (e.g., cancer and cardiovascular and respiratory diseases); specific interests in exposure assessment and epidemiology of air pollution and applications of GIS.

Jonathan I. Levy, SD; Mark and Catherine Winkler Associate Professor of Environmental Health and Risk Assessment. Air pollution exposure assessment and risk assessment; health impact assessment of power plants and transportation sources.

Chensheng (Alex) Lu, MS, PhD; Mark and Catherine Winkler Assistant Professor of Environmental Exposure Biology. Environmental exposure biology; pesticide exposure and human health; neurodevelopmental and neurobehaviroal toxicity in children; cumulative risk assessment for pesticide exposure.

Quan Lu, MS, PhD; Mark and Catherine Winkler Assistant Professor of Lung Biology. Receptor signaling and trafficking; gene-environment interaction; global "loss-of-function" genetic screen.

Melissa Perry, MHS, ScD; Associate Professor of Occupational Epidemiology. Occupational epidemiology and preventive intervention research; endocrine disruption and chromosomal abnormalities; health impacts of pesticide exposure.

Stephen N. Rudnick, MS, SM, SD; Lecturer on Occupational Hygiene Engineering. Engineering control of disease transmission via air or fomites; aerosol technology.

Joel D. Schwartz, PhD; Professor of Environmental Epidemiology. Environmental epidemiology; natural history of lung function and disease; cost-benefit analysis; time series analysis; nonparametric smoothing and graphical methods.

James P. Shine, PhD; Senior Lecturer on Aquatic Chemistry. Transport and fate of contaminants in aquatic ecosystems.

Stephanie A. Shore, PhD; Senior Lecturer on Physiology. Obesity and asthma; airway smooth-muscle biology; air pollution and asthma.

Thomas J. Smith, MPH, MS, PhD; Professor of Occupational hygiene. Exposure assessment for epidemiologic studies; environmental chemical hazards; biomarkers of exposure; hazards of diesel exhaust exposure.

Frank E. Speizer, MD; Professor of Environmental Science. Health effects of air pollution; interests in cancer and cardiovascular and pulmonary diseases and in healthy aging.

John D. Spengler, PhD, SM; Akira Yamaguchi Professor of Environmental Health and Human Habitation. Indoor air quality; health risk assessment; sustainable design; healthy communities.

Helen H. Suh, SM, SD; Associate Professor of Environmental Chemistry and Exposure Assessment. Air pollution exposures and health effects; GIS; nation-wide chronic exposure models; indoor pollution; source apportionment.

Daniel J. Tschumperlin, MS, PhD; Associate Professor of Bioengineering and Airway Biology. Asthma, pulmonary fibrosis, and other environmentally related lung diseases; remodeling of the lung; transduction of physical forces at a cellular and molecular level.

Marc G. Weisskopf, PhD, SM, SD; Mark and Catherine Winkler Assistant Professor of Environmental and Occupational Epidemiology. Epidemiology of neurological disease with an emphasis on environmental exposures; environmental effects on brain physiology and neurological function (e.g., cognitive function and psychiatric symptoms).

Secondary Appointments

(primary appointments at Harvard Medical School)

Elisha H. Atkins, MD, SM; Assistant Professor in the Department of Environmental Health. Hospital-worker health and safety.

David C. Bellinger, PhD, SM; Professor in the Department of Environmental Health. Developmental impact of early metabolic and chemical insults to the nervous system; neuropsychological toxicology.

Augustine M.K. Choi, MD; Professor in the Department of Environmental Health. Oxidative stress and lung injury; signal transduction and gene regulation; cell death and autophagy; regulation and physiologic function of gaseous molecule carbon monoxide.

Jeffrey M. Drazen, MD; Professor in the Department of Environmental Health. Pulmonary and respiratory pharmacology; mediators of immediate hypersensitivity; mucus regulation and expression in chronic bronchitis.

John J. Godleski, MD; Associate Professor in the Department of Environmental Health. Experimental models of normal and pathologic responses to inhaled particles.

Diane R. Gold, MD, MPH; Associate Professor in the Department of Environmental Health. Influence of early-life environmental exposures on allergy and asthma development; cardiovascular and pulmonary effects of air pollution.

Rose H. Goldman, MD, MPH, SM; Associate Professor in the Department of Environmental Health. Metal poisoning and toxicity; neurotoxicity; repetitive strain injuries; medical and public health education.

Stefanos (Stephen) N. Kales, MD, MPH; Assistant Professor in the Department of Environmental Health. Firefighters, emergency responders, environmental/workplace exposures, and metabolic health effects; chemical emergencies; heavy metals; traditional Indian medications.

Jeffrey N. Katz, SM, MD; Associate Professor in the Departments of Epidemiology and Environmental Health. Clinical policy relating to noninflammatory musculoskeletal conditions; health policy questions; back pain and upper-extremity disorders.

Lester Kobzik, MD; Professor in the Department of Environmental Health. Lung defenses against inhaled particles and pathogens; pulmonary inflammation and pathology.

Christos S. Mantzoros, MD, DSc, MMSc, SM; Associate Professor in the Department of Environmental Health. Obesity, diabetes, and malignancies: biomarkers, molecular epidemiology, and translational research.

Edward A. Nardell, MD; Associate Professor in the Departments of Environmental Health and Immunology and Infectious Diseases. Airborne transmission and infection control of *Mycobacterium tuberculosis*; air disinfection with ultraviolet irradiation.

Richard L. Verrier, PhD; Associate Professor in the Department of Environmental Health. Neural triggers of sudden cardiac death; cardiac electrophysiology; T-wave alternans; coronary hemodynamic function; novel delivery systems for anti-arrhythmic therapy.

Scott T. Weiss, MD, SM; Professor in the Department of Environmental Health. Natural history of chronic lung disease; epidemiology of asthma and hypertension; cardiovascular, occupational, environmental, and genetic epidemiology.

Robert O. Wright, MD, MPH; Associate Professor in the Department of Environmental Health. Pediatric environmental health; gene-environmental interactions; psychosocial factors as modifiers of chemical neurotoxicants.

Rosalind J. Wright, MD, MPH; Assistant Professor in the Department of Environmental Health. Stress and health; asthma disparities; social determinants of lung disease.

Adjunct Faculty

Andrea Baccarelli, MD, PhD. University of Milan, Italy.

Costas A. Christophi, MS, PhD. Cyprus International Institute for the Environment and Public Health.

Ellen A. Eisen, SM, SM, SD. University of California, Berkeley.

Philippe Grandjean, MD, DMSc. Odense University, Denmark.

Steven R. Hanna, MS, PhD. Hanna Consultants.

Howard Hu, MD, MPH, SM, SD. University of Michigan.

Tom B. Leamon, MSc, MSc, PhD. Liberty Mutual Research Institute for Safety.

Nancy C. Long Sieber, PhD.

Edward F. Maher, MS, SD. Dade Moeller & Associates.

Konstantinos Makris, PhD. Cyprus International Institute for the Environmental and Public Health.

Donald K. Milton, MD, MPH, DPH. University of Massachusetts, Lowell.

Joseph P. Mizgerd, SD. Boston University.

Gregory Norris, MS, PhD. Sylvatica.

Annette Peters, SM, PhD. Institute of Epidemiology, Neuherberg, Germany.

Robert B. Pojasek, PhD. First Environment Inc., Boonton, NJ.

Christine A. Rogers, PhD. University of Massachusetts, Amherst.

Gregory R. Wagner, MD. National Institute for Occupational Safety and Health.

David H. Wegman, MD, SM. University of Massachusetts, Lowell.

Xin Xu, MD, PhD.

Pierre A. Zalloua, MA, PhD. Lebanese American University.

Department of EPIDEMIOLOGY

JOHN JACKSON

Doctoral student, Department of Epidemiology

John Jackson used to believe that solutions to diseases would be found through advances in biomedical research. But a public health conference on health disparities made him appreciate that improvements in health often depend on factors outside of medicine. "I realized that you could have a world-class treatment, but without proper infrastructure, health education, and access to care it would do little to ease the burden of disease."

After graduating from the University of Maryland with a bachelor's in biochemistry, John began working as a research assistant at the Center for Health Disparities Solutions at Johns Hopkins University. There he learned public health research from the ground up, starting as a research assistant and eventually studying management and data analysis.

Much of what he learned, though, came from living in communities similar to the ones he studied. "Teaching adult education classes and working as a community liaison brought me face to face with people whose unmet need for mental health care severely limited their ability to live full, healthy, and productive lives," he says. John became convinced that mental health was integral to improving health and quality of life.

At HSPH he is gaining the theoretical and analytical skills needed to contribute to the growing field of psychiatric epidemiology. John has been particularly impressed with the department's causal inference program. "It is a different way of thinking about epidemiology, not offered anywhere else, and has clarified the kinds of questions I ask and the ways I think about answering them."

EPIDEMIOLOGY—THE STUDY OF THE FREQUENCY, DISTRIBUTION, AND DETERMINANTS OF DISEASE IN HUMANS—IS A FUNDAMENTAL SCIENCE OF PUBLIC HEALTH.

EPIDEMIOLOGISTS USE MANY APPROACHES, but the ultimate aim of epidemiologic research is the prevention or effective control of human disease.

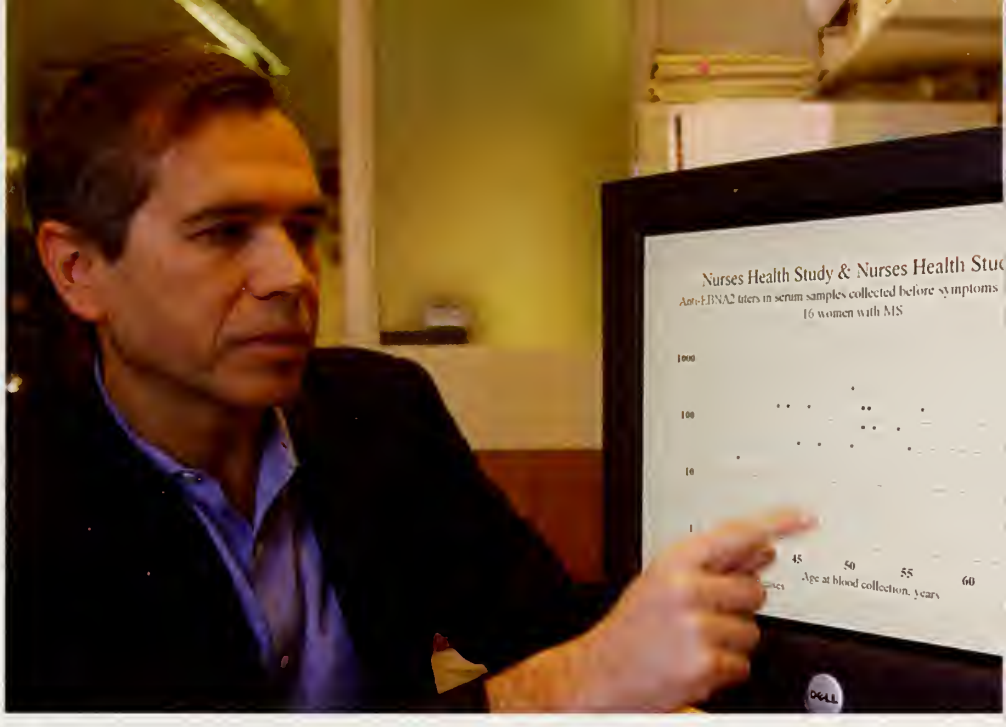
The Department of Epidemiology has a long tradition of teaching and research, including in the epidemiology of cancer, cardiovascular and other chronic diseases, and infectious diseases, as well as in epidemiologic methodology. Current research in the department includes the role of infections in the etiology of cancer; the connection between diet and risk of cancer, cardiovascular disease, and other major chronic diseases; the relationship between exposure to chemicals in the workplace and the development of cancer; the epidemiology of infectious disease; factors in early life predisposing individuals to chronic diseases; case identification and risk factors in mental disorders; health effects of drugs, vaccines, and medical devices; and causes of human infertility.

Degree Programs in Epidemiology

As described below, the department offers both 80-credit and 42.5-credit master of science (SM) programs, as well as a doctor of science (SD) and doctor of public health (DPH) program. For information about schoolwide requirements for master's and doctoral programs, see page 5.

Students in all degree programs choose from among thirteen areas of interest:

Cancer epidemiology In addition to research methodology, the curriculum in this area includes courses on the biology and genetics of cancer; the basic concepts and issues of cancer epidemiology; the roles of lifestyle factors such as diet and physical activity; environmental and occupational exposures in the etiology of cancer; the integration of biomarkers (e.g., plasma, genetic, and tumor markers) into research; the prevention of cancer; and research



methods. Research opportunities for students include a large number of ongoing cohort and case-control studies conducted within the department or at associated institutions and in conjunction with the Dana-Farber/ Harvard Cancer Center.

Cardiovascular epidemiology This area provides training in research methodology and the epidemiology of cardiovascular diseases. Doctoral students conduct research in a substantive or methodological area related to cardiovascular epidemiology. Research opportunities for graduate and postdoctoral students include a broad area of topics, including the role of diet, genetics, plasma markers, lifestyle characteristics, clinical interventions, and environmental predictors of primary and secondary onset of cardiovascular disease. Trainees will have the opportunity to work with several large ongoing cohort and case-crossover studies and to interact with other trainees and investigators through forums and other activities organized by the program in cardiovascular epidemiology centered at HSPH.

Clinical epidemiology This area is designed primarily for clinicians and other health care professionals in the 42.5-credit master's program who wish to develop the quantitative skills needed for clinical research. Students take core courses in epidemiology and biostatistics to develop basic skills in study design and analysis that will allow them to examine clinical questions related to the diagnosis and treatment of disease. Additional courses in epidemiology and courses offered by other departments address related topics of potential interest such as health status and quality-of-life measurement, decision analysis, cost-effectiveness analysis, health services research, and quality improvement of health care.

While the appropriate content for this area may be covered by taking courses offered during the regular academic year (fall and spring semesters), requirements for the 42.5-credit SM degree in epidemiology may also be partially fulfilled by taking the summer courses offered through the Summer Program in Clinical Effectiveness and the Summer Session in Public Health Studies. In this schedule students begin their program by taking a core set of courses during an initial summer period. They complete the SM program by taking advanced courses during the regular academic year and, if desired, during two or more summer periods. Alternatively, students can satisfy the requirements for the 42.5-credit SM degree by taking courses during summer periods and completing a supervised research project. The content of this project typically entails the design and implementation of a clinical study, the analysis of the resulting data, and the creation of a manuscript of quality suitable for publication. An outline for this project must be submitted at the time of application.

Environmental/occupational epidemiology This area is closely associated with the concentrations in exposure, epidemiology, and risk and in occupational health in the Department of Environmental Health. Students take courses in epidemiology, environmental health, occupational health, biostatistics, toxicology, genetics, and environmental exposure assessment. Doctoral students conduct research in a substantive or methodologic area related to environmental or occupational health. Research emphasis includes the relationships between environmental and occupational exposures and cancer, children's health, cardiopulmonary disease, neurodegenerative disease, reproductive health, and gene-environment interactions.

Epidemiologic methods This area provides training in the development and application of new methods in epidemiologic research. Students learn to use and justify classical epidemiologic methods in study design, data analysis, and interpretation of results. Students also receive training in biostatistical areas most relevant to epidemiologic research. Recent innovations in epidemiologic methodology are introduced through advanced courses and tutorials. Doctoral students conduct research with faculty members in the development of new methodologies and in novel applications of existing methodologies. Those enrolling in this area of interest ordinarily have completed four semesters of college calculus and one semester of linear algebra. Students engaged in this area will have an opportunity for collaboration with researchers working on causal inference in epidemiology and allied sciences.

Epidemiology of aging This area is geared toward those interested in the diseases and conditions, as well as research methods, specific to older populations. Social and cultural aspects of health in older persons are also covered. Core courses focus on the epidemiologic aspects of the study of aging and include topics in biology, statistics, and other relevant fields. Numerous research opportunities on a wide range of issues, including neurologic diseases, osteoporosis, incontinence, and others, are available in the Department of Epidemiology, as well as the Department of Nutrition, Channing Laboratory, the Division of Preventive Medicine at Brigham and Women's Hospital, and Hebrew SeniorLife.

Infectious diseases Research in this area focuses on the biological and dynamic features of infectious diseases, with emphasis on the use of epidemiologic approaches to study the social, behavioral, and biological determinants of infectious disease emergence, transmission, pathogenesis, and immunity. Courses within the department cover the common features of communicable diseases and their dynamics, methods

for the analysis of transmission dynamics, and advanced topics in the epidemiology of certain specific infectious diseases, especially HIV. Courses in other departments provide introductions to the epidemiology of additional specific infectious diseases and to additional relevant methodologies, including spatial and time series analysis. Students in this area ordinarily join the interdisciplinary concentration in the epidemiology of infectious disease.

Molecular/genetic epidemiology This area introduces students to the application of molecular and genetic methods in epidemiology. These methods may be useful as measures of exposure, disease susceptibility, or disease outcome. Training encompasses family-based association methods, genome-wide association studies to identify the chromosomal localization of genes associated with disease, and fine mapping and identification of these genes. Population-based studies correlate variation in genes with disease risk and prognosis and assess gene-environment interactions. Relevant courses explore the genetic epidemiology of complex diseases, including cancer, cardiovascular disease, diabetes, psychiatric illnesses, Alzheimer's disease, and asthma, as well as individual variation in drug response (pharmacogenomics). Students can collaborate with the HSPH Department of Environmental Health, the Channing Laboratory, the Dana-Farber Cancer Institute, and other research groups.

Neuro-psychiatric epidemiology Within this increasingly integrated area of interest, students typically elect one of two focus areas:

- neuroepidemiology, which provides training in research methodology and the epidemiology of neurological diseases. Current research emphasizes the roles of diet, infections, and environmental exposures in the etiology of neurodegenerative diseases such as multiple sclerosis, Parkinson's disease, and amyotrophic lateral sclerosis and integrates biomarkers and genetic factors. Doctoral students conduct research in a substantive or methodological area related to neuroepidemiology.
- psychiatric epidemiology, which introduces students to concepts and methods for studying the genetic and psychosocial factors that relate to the prevalence, incidence, and outcome of different types of psychiatric illnesses. Emphasis is given to issues of reliability and validity in studying such disorders among children, adolescents, and adults. The curriculum consists of six specialized courses, as well as related courses offered in the HSPH Departments of Epidemiology, Biostatistics, and Society, Human Development, and Health. A wide range of research opportunities are available, with particular depth in psychiatric genetics, mental health services, pharmacoepidemiology, clinical trials, prevention, and community and cross-cultural studies.

Nutritional epidemiology Through courses in the Departments of Epidemiology and Nutrition, students in this area learn methods of nutritional assessment and their related strengths and weaknesses. Students also receive advanced training in the nutritional determinants of disease and in meth-

COURSES OF INSTRUCTION

Please note that the courses listed are subject to change and some are not offered every year. Complete course descriptions are available at http://www.hsph.harvard.edu/registrar/courses.

Principles of Epidemiology
Introduction to Epidemiology
Elements of Epidemiologic Research: Methods II
Study Design in Epidemiologic Research
Analysis of Case-Control and Cohort Studies
Practice of Epidemiology
Advanced Epidemiologic Methods
Introduction to Clinical Epidemiology
Epidemiology of Cancer
Advanced Topics in the Analysis of Case Control and Cohort Study
Epidemiology in Public Health Practice
Assessment Concepts and Methods in Psychiatric Epidemiology
Psychiatric Diagnosis in Clinic and Community Populations
Pharmacoepidemiology—Introductory and Advanced
Genetic Epidemiology of Diabetes and Its Complications
Cardiovascular Epidemiology I and II
Cancer Prevention
Oral Epidemiology
Ophthalmic Epidemiology
Research Synthesis and Meta-Analysis
Epidemiologic Methods in Health Services Research
Analytical Aspects of Clinical Epidemiology
Use of Biomarkers in Epidemiologic Research
Measuring Health Status
Seminar in Applied Research in Clinical Epidemiology
Genetic Epidemiologic Methods for Psychiatric and Other Disorders
Applied Biomarkers in Cancer Epidemiology
Epidemiologic Methods Development—Past and Present
Molecular Biology for Epidemiologists
Molecular Epidemiology of Cancer
Infections and Cancer
Epidemiology of Aging
Epidemiology of HIV Infection I: Etiology, Natural History, and Transmission
Epidemiology of HIV Infection II: Therapeutic and Prevention Interventions
Advanced Seminar in Cancer Epidemiology
Mathematical Modeling of Infectious Diseases
Epidemiologic Research in Obstetrics and Gynecology
Advanced Reproductive Epidemiology
Seminar in Clinical Epidemiology
Propensity Score Analysis: Theoretical and Practical Considerations
Epidemiology of Neurologic Diseases
Data Mining and Prediction
Models for Causal Inference
Data Collection
Advanced Topics in Epidemiologic Methods
Analysis of Genetic Association Studies Using Unrelated Subjects
Screening
Bridging Psychiatric Morbidity and Reproductive Outcomes
Research: Clinical Epidemiology
Fundamentals of Epidemiology
Dynamics of Infectious Diseases
Epidemiology of Disorders and Diseases of Childhood and Young Adulthood
Epidemiologic Methods for Global Health
Oral Health Policy Research Seminar
Epidemiologic Investigation of Social and Environmental Risks for Psychiatric Disorders
Inference in Infectious Disease Epidemiology
Nutritional Epidemiology of Cancer
Developmental Epidemiology of Adult Psychiatric Disorders
Obesity Epidemiology
Introduction to Pharmacoepidemiology
Case-Based Seminars on Drug Safety
Independent Study, Tutorials

ods for analysis specific to research in nutritional epidemiology. Students can conduct research within several large prospective ongoing studies at HSPH and Harvard Medical School, including an examination of dietary factors in relation to cardiovascular disease, cancer, and other chronic diseases; a study of the interactions between nutritional and genetic determinants of disease; and the assessment of nutritional supplementation in relation to infectious agents and malnutrition.

Oral and dental health epidemiology This area prepares dentists and other degree candidates with an interest in oral health for relevant research and teaching careers. Focus areas are oral cancer etiology, gene-environment interactions in oral disease, the links between oral health and systemic conditions such as diabetes or stroke, and the global epidemiology of common dental diseases such as caries and periodontitis. Students can participate in field research activities; epidemiologic studies of oral health; or clinical trials designed to test preventive, diagnostic, or therapeutic interventions. This area of interest is jointly administered by the Department of Oral Health Policy and Epidemiology in the Harvard School of Dental Medicine and the HSPH Department of Epidemiology.

Pharmacoepidemiology This area focuses on the determinants of both unintended and expected effects of drugs, vaccines, biologics, medical procedures, and medical devices. Patterns of utilization, cost-benefit and risk-benefit analyses, and investigation of the distribution of diseases possibly amenable to medical intervention represent important secondary themes. The Department of Epidemiology offers courses in pharmacoepidemiology and a variety of ongoing research projects. Relevant courses elsewhere in the school cover such areas as clinical trials, meta-analysis, drug regulatory affairs, decision analysis, and health services research. Students in pharmacoepidemiology have the opportunity to attend courses and congresses outside the school and are encouraged to undertake internships in regulatory agencies or pharmaceutical and biotechnology companies. Students ordinarily have a prior degree in medicine or pharmacy. Others are expected to acquire substantially equivalent expertise in areas related to their research.

RELATED OFFERINGS

Exposure, epidemiology, and risk and occupational health concentrations, Department of Environmental Health, see pages 10 and 12.
Interdisciplinary concentration in maternal and child health/children, youth, and families, see page 57.
Interdisciplinary concentration in obesity epidemiology and prevention, see page 57.
Interdisciplinary concentration in the epidemiology of infectious disease, see page 58.
Interdisciplinary concentration in women, gender, and health, see page 58.
Summer Program in Clinical Effectiveness, see page 59.

Reproductive epidemiology This area focuses on the determinants and consequences of reproduction, including women's health and male infertility. Students can explore pubertal development, gynecologic disorders, sexually transmitted infections, the menstrual cycle, menopause, fertility, conception, assisted reproductive technologies, and pregnancy as endpoints or as factors influencing disease outcomes. The Obstetrics and Gynecology Epidemiology Center, based at Brigham and Women's Hospital, offers the opportunity to gain experience in data collection and analysis of large-scale population- and clinical-based epidemiologic studies. Students may collaborate with faculty members at HSPH and Harvard Medical School and also have the opportunity to pursue gynecological and reproductive health research at the many resources available in the area, including the Channing Laboratory, Harvard Pilgrim Health Care, and the Division of Preventive Medicine and Connors Center for Women's Health and Gender Biology at Brigham and Women's Hospital. Students are encouraged and given guidance on how to submit their own research proposals for private or federal funding.

Master of Science in Epidemiology (80-credit and 42.5-credit programs)

The master's programs provide students with basic skills in epidemiology, quantitative methods, and computing, in preparation for research or academic careers. Graduates have taken positions as researchers in university and hospital settings and as epidemiologists for public health agencies and private companies.

The 80-credit SM program is designed for individuals who hold a bachelor's degree and have a strong background in biology and mathematics. The 42.5-credit program is open to applicants with a medical degree or master's-level background in biology.

Required courses are similar for the 80-credit and 42.5-credit programs and include both schoolwide requirements and specific courses in epidemiology.

In addition to epidemiology and statistics courses, students in the 80-credit program study the basic medical sciences and the biological aspects of public health problems. The program is primarily intended for students who expect to continue toward a doctoral degree. Recommended courses cover human physiology, the pathophysiology of human disease, and specified courses in biostatistics. In the 42.5-credit program, remaining courses reflect areas of special interest and may include supervised research.

Doctor of Science in Epidemiology/ Doctor of Public Health

The doctoral programs are designed for students who plan careers in epidemiologic research or teaching or for those who aspire to leadership roles in the health professions. Recent graduates are working in major universities, medical schools, and research institutes. They also serve as epidemiologists for the National Cancer Institute, Centers for Disease Control and Prevention, other domestic and international governmental institutions, and private industry.

Applicants to the SD program should hold at least a bachelor's degree and have a strong background in biology and mathematics. For these individuals the degree generally takes four to five years to complete; candidates with relevant master's and doctoral degrees may complete the program in three years. Applicants to the DPH program must have or be in progress toward an MPH degree and must also hold an advanced degree in a basic public health discipline.

Normally most of the first two years is devoted to course work. Course requirements are the same as for the SM program, with the addition of specified courses in epidemiology and biostatistics. Ten credits are also required in substantive courses offered by the department. Of the two minors required for the degree, one must be in advanced biostatistics.

Funding may be available for U.S. citizens or permanent residents enrolled in the doctoral program or a postdoctoral fellowship program, depending on the specialty area, and terms of funding. Sources of support include the National Cancer Institute, the National Institute of Environmental Health Sciences, the Food and Drug Administration, and the National Institute of Allergy and Infectious Diseases. For U.S. citizens and permanent residents interested in cardiovascular disease or aging, research traineeships may be available through Harvard Medical School. The National Institute of Aging also offers research traineeships for doctoral students, postdoctoral fellows, and physicians engaged in postdoctoral training.

Contact Information

For more information about research and training in epidemiology, please contact the coordinator of academic services, Department of Epidemiology, 677 Huntington Avenue, Boston, MA 02115, or visit the department website.
Phone: 617-432-1055
Fax: 617-566-7805
Web: http://www.hsph.harvard.edu/departments/epidemiology

DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2009–10.

Department chair: Hans-Olov Adami, MD, PhD; Professor of Epidemiology. Cancer epidemiology; global health; women's health; prostate cancer; renal cell cancer; breast cancer.

Alberto Ascherio, MD, MPH, DPH; Professor of Epidemiology and Nutrition. Nutritional epidemiology; epidemiology of neurological diseases.

Lisa F. Berkman, MS, PhD; Thomas D. Cabot Professor of Public Policy and of Epidemiology. Social epidemiology; population health; epidemiology of aging.

David C. Christiani, MD, MPH, SM; Professor of Occupational Medicine and Epidemiology. Environmental and occupational molecular epidemiology; gene-environment interactions; environmental genetics.

E. Francis Cook, MA, SM, SD; Professor of Epidemiology. Epidemiologic methods; clinical epidemiology.

Douglas W. Dockery, SM, SM, SD; Professor of Environmental Epidemiology. Epidemiologic studies of respiratory health effects of air pollution; environmental exposures and lifetime development of respiratory disease

Wafaie W. Fawzi, MBBS, MPH, SM, DPH; Professor of Nutrition and Epidemiology. Etiologies of infectious diseases and perinatal conditions with emphasis on dietary and nutritional causes; dietary factors in disease in pregnancy and childhood.

Stephen E. Gilman, SM, SD; Assistant Professor of Society, Human Development, and Health. Social epidemiology of psychiatric disorders; health disparities and the life course.

Edward L. Giovannucci, MD, MPH, SD; Professor of Nutrition and Epidemiology. Etiologies of cancer with emphasis on dietary causes, particularly for prostate and colorectal cancers; methodologies to measure dietary factors in epidemiologic studies.

Russ B. Hauser, MD, MPH, SD; Professor of Environmental and Occupational Epidemiology. Reproductive and developmental epidemiology; impact of endocrine disruptors on fertility and pregnancy outcomes; contaminants.

Miguel A. Hernán, MD, MPH, MS, DPH; Associate Professor of Epidemiology. Epidemiologic methods; neuroepidemiology; HIV/AIDS.

Sonia Hernández-Díaz, MD, MPH, DPH; Associate Professor of Epidemiology. Drug safety evaluation from observational data, with a special emphasis in the analysis of patterns of use and safety of drugs during pregnancy.

Frank B. Hu, MD, MPH, PhD; Professor of Nutrition and Epidemiology. Nutritional and genetic epidemiology of obesity, diabetes, and cardiovascular disease.

David J. Hunter, MB, BS, MPH, SD; Vincent L. Gregory Professor of Cancer Prevention. Genetic epidemiology; cancer epidemiology; international health.

Karestan C. Koenen, MA, PhD; Associate Professor of Society, Human Development, and Health. Trauma; posttraumatic stress disorder; developmental psychopathology; gene-environment interaction; psychiatric epidemiology.

Peter Kraft, MA, MS, PhD; Associate Professor of Epidemiology. Genetic epidemiology of complex diseases, especially cancer.

Francine Laden, MS, SD; Mark and Catherine Winkler Associate Professor of Environmental Epidemiology. Environmental risk factors of chronic diseases (e.g., cancer and cardiovascular and respiratory diseases); specific interests in exposure assessment and epidemiology of air pollution and applications of GIS.

Marc Lipsitch, DPhil; Professor of Epidemiology. Population biology of infectious agents; epidemiologic methods for emerging infections; antimicrobial resistance; *Streptococcus pneumoniae*; immuno-epidemiology.

Megan B. Murray, MD, MPH, SD; Associate Professor of Epidemiology. Use and evolution of molecular markers in tuberculosis; transmission dynamics of infectious diseases; study of vaccine effects.

Alkes L. Price, MSE, PhD; Assistant Professor of Statistical Genetics. Population genetics and its relevance to disease mapping.

James M. Robins, MD; Mitchell L. and Robin LaFoley Dong Professor of Epidemiology. Analytic methods for drawing causal inferences in epidemiology and statistics.

Joel D. Schwartz, PhD; Professor of Environmental Epidemiology. Environmental epidemiology; natural history of lung function and disease; cost-benefit analysis; time series analysis; nonparametric smoothing and graphical methods.

George R. Seage III, MPH, DSc; Associate Professor of Epidemiology. HIV epidemiology, transmission, and prevention; translational research (impact of ARV's on pediatric outcomes); HIV epidemiological methods; evaluation of long-term drug toxicities.

Stephanie A. Smith-Warner, MS, PhD; Associate Professor of Nutritional Epidemiology. Examination of dietary factors in relation to cancer risk.

Donna L. Spiegelman, SM, SD; Professor of Epidemiologic Methods. Statistical methods for epidemiologic research; measurement error and misclassification; global epidemiology.

Meir J. Stampfer, MD, MPH, DPH; Professor of Nutrition and Epidemiology. Influence of diet and lifestyle on health, particularly prostate cancer, other cancers, heart disease, and cognitive decline.

Eric J. Tchetgen, PhD; Assistant Professor of Epidemiology. Methods for causal inference and missing-data models; semiparametric statistical methods for high-dimensional data; genetic epidemiology.

Dimitrios V. Trichopoulos, MD, SM; Vincent L. Gregory Professor of Cancer Prevention. Cancer epidemiology; hormone-dependent cancer intrauterine origin hypothesis.

Tyler J. VanderWeele, MA, AM, PhD; Associate Professor of Epidemiology. Epidemiologic methods; causal inference.

Marc G. Weisskopf, PhD, SM, SD; Mark and Catherine Winkler Assistant Professor of Environmental and Occupational Epidemiology. Epidemiology of neurological disease with an emphasis on environmental exposures; environmental effects on brain physiology and neurological function (e.g., cognitive function and psychiatric symptoms).

Walter C. Willett, MD, MPH, DPH; Fredrick John Stare Professor of Epidemiology and Nutrition. Nutrition; physical activity; endogenous hormones and risks of noncommunicable disease; dietary assessment methods.

Secondary Appointments

(primary appointments at Harvard Medical School, Harvard School of Dental Medicine, or Harvard Faculty of Arts and Sciences)

Deborah Blacker, MD, SD; Associate Professor in the Department of Epidemiology. Psychiatric epidemiology; assessment methods; genetic epidemiology; epidemiology of Alzheimer's disease and other neuropsychiatric disorders; genetic association analysis.

Julie E. Buring, MS, SD; Professor in the Department of Epidemiology. Epidemiology of chronic disease, primarily cardiovascular disease and cancer; epidemiologic methodology, especially clinical trials.

Carlos A. Camargo, Jr., MPH, MD, DPH; Associate Professor in the Department of Epidemiology. Asthma/COPD; anaphylaxis; emergency medicine; U.S. dietary guidelines.

Theodore H. Cohen, MD, DrPH; Assistant Professor in the Department of Epidemiology. Transmission of tuberculosis within and between communities.

Nancy R. Cook, SM, SD; Associate Professor in the Department of Epidemiology. Longitudinal data analysis; predictive modeling; hypertension prevention.

Daniel W. Cramer, MD, SM, SD; Professor in the Department of Epidemiology. Ovarian cancer; endometriosis; reproductive epidemiology.

Gary C. Curhan, MD, SM, SD; Associate Professor in the Department of Epidemiology. Nephrolithiasis risk factors and prevention; renal function decline risk factors; hypertension risk factors and prevention; gout; painful bladder syndrome; pneumonia; shingles.

Immaculata DeVivo, MPH, PhD; Associate Professor in the Department of Epidemiology. Etiology of cancer, specifically the relationship between genetic variation and disease risk for future prevention.

Alessandro Doria, MD, PhD, MPH; Associate Professor in the Department of Epidemiology. Genetic epidemiology of type-2 diabetes, especially early-onset forms; genetic epidemiology of coronary artery disease in diabetes.

Chester W. Douglass, DMD, MPH, PhD; Professor in the Department of Epidemiology. Oral epidemiology and health policy.

Alison E. Field, SD; Associate Professor in the Department of Epidemiology. Weight gain and obesity; weight cycling; eating disorders; pediatric epidemiology.

A. Lindsay Frazier, MD, ScM; Associate Professor in the Department of Epidemiology. Colorectal cancer screening and prevention.

Francine Grodstein, SD; Associate Professor in the Department of Epidemiology. Aging; health effects of exogenous hormones; risk factors for Alzheimer's disease.

Susan E. Hankinson, MS, MPH, SD; Associate Professor in the Department of Epidemiology. Relationships between hormonal factors and risk of breast and ovarian cancers.

Michelle D. Holmes, MD, DrPH; Associate Professor in the Department of Epidemiology. Lifestyle factors affecting quality of life and survival after a cancer diagnosis, as well as cancer risk; development of observational and intervention studies in Africa and other parts of the developing world.

Jeffrey N. Katz, SM, MD; Associate Professor in the Departments of Epidemiology and Environmental Health. Clinical policy relating to noninflammatory musculoskeletal conditions; health policy questions; back pain and upper-extremity disorders.

Tobias Kurth, MD, SM, SD; Assistant Professor in the Department of Epidemiology. Risk factors for stroke, migraine, and chronic kidney disease; risks and benefits of analgesic use; propensity scores.

I-Min Lee, MBBS, MPH, SD; Associate Professor in the Department of Epidemiology. Epidemiology of cancer; physical activity and fitness and cancer incidence.

JoAnn E. Manson, MD, MPH, DPH; Professor in the Department of Epidemiology. Chronic disease epidemiology; cardiovascular and diabetes epidemiology; hormone replacement therapy; biomarkers.

Karin B. Michels, MS, MPH, SD, MSc, DPhil; Associate Professor in the Department of Epidemiology. Nutritional epidemiology and methodology; perinatal and reproductive risk factors for breast cancer.

Stacey A. Missmer, SM, SD; Assistant Professor in the Department of Epidemiology. Reproductive epidemiology: endometriosis, uterine leiomyoma, assisted reproductive technology, endogenous sex steroid hormones.

Murray A. Mittleman, MDCM, MPH, DPH; Associate Professor in the Department of Epidemiology. Epidemiology of acute risk factors triggering myocardial infarction and stroke; methodological problems in implementing case-crossover studies.

Dariush Mozaffarian, MD, DPH; Assistant Professor in the Department of Epidemiology. Cardiovascular epidemiology, particularly effects of dietary and lifestyle habits.

Lorelei A. Mucci, MPH, SD; Assistant Professor in the Department of Epidemiology. Biomarker studies of prostate cancer risk and survival.

Jane M. Murphy, PhD; Professor in the Department of Epidemiology. Longitudinal studies of psychiatric epidemiology in general populations.

David L. Pauls, PhD; Professor in the Department of Epidemiology. Inheritance of behavior disorders in children and adults, specifically the interaction of genetic and environmental factors in the expression of these illnesses.

Janet W. Rich-Edwards, MPH, SD; Assistant Professor in the Department of Epidemiology. Prenatal and childhood predictors of cardiovascular disease and diabetes; lifestyle determinants of fertility and pregnancy outcome.

Paul M. Ridker, MD, MPH; Professor in the Department of Epidemiology. Molecular and genetic epidemiology of hemostasis, thrombosis, and inflammation; "predictive" medicine; etiology and prevention of acute coronary syndromes.

Eric B. Rimm, SD; Associate Professor in the Departments of Epidemiology and Nutrition. Nutrition; cardiovascular disease; genetics; biomarkers; obesity; chronic disease; epidemiology: cohort studies.

Susan L. Santangelo, SD; Associate Professor in the Department of Epidemiology. Genetic epidemiology of psychiatric disorders; statistical modeling of genetically complex (non-Mendelian) diseases.

Debra A. Schaumberg, SD, OD, MPH; Associate Professor in the Department of Epidemiology. Epidemiology of eye diseases (cataract, macular degeneration, diabetic retinopathy, dry eye syndrome); genetic epidemiology; biomarkers for eye disease; blindness prevention.

Eva S. Schernhammer, MD, MPH, DPH, MS; Assistant Professor in the Department of Epidemiology. Chronic disease epidemiology; cancer biomarker and circadian rhythm research.

Sebastian Schneeweiss, MD, SM, SD; Associate Professor in the Department of Epidemiology. Pharmacoepidemiology and pharmaceutical outcomes research.

Daniel E. Singer, MD, MA; Professor in the Department of Epidemiology. Preventive health care.

Jordan W. Smoller, MD, SD; Associate Professor in the Department of Epidemiology. Psychiatric epidemiology; genetic association analysis; epidemiology and genetics of mood disorders; anxiety disorders, psychotic disorders and ADHD; pharmacogenetics.

Rulla Tamimi, MS, SD; Assistant Professor in the Department of Epidemiology. Molecular and cancer epidemiology; epidemiology of breast cancer with a focus on intermediate markers of risk.

Shelley S. Tworoger, MS, PhD; Assistant Professor in the Department of Epidemiology. Biomarkers in ovarian and breast cancer risk; ovarian cancer etiology.

Rob M. Van Dam, MSc, PhD; Assistant Professor in the Departments of Nutrition and Epidemiology. Determinants of the development of obesity and type-2 diabetes with a particular interest in the role of diet.

Athanasios I. Zavras, DMD, MS, DMSc; Associate Professor in the Department of Epidemiology. Pharmacogenetics; molecular epidemiology of cancer; epidemiology of oral diseases.

Shumin Zhang, MD, MSc, SD; Assistant Professor in the Department of Epidemiology. Etiology of cancer; nutritional epidemiology; health effects of antioxidants, folates, alcohol, lipids, and obesity; biomarkers of nutrients.

Adjunct Faculty

Monique M. B. Breteler, MSc, MD, PhD. Erasmus University Medical Center, Rotterdam, the Netherlands.

Kin-Wei Arnold Chan, MD, MPH, SD. Ingenix Pharmaceutical Services.

Graham A. Colditz, MBBS, MPH, DPH, MD. Washington University School of Medicine.

Richard C. Dicker, MD, SM. Centers for Disease Control and Prevention.

Bernard L. Harlow, MPH, PhD. University of Minnesota School of Public Health.

Albert Hofman, MD, PhD. Erasmus University Medical School, Rotterdam, the Netherlands.

Chung-Cheng Hsieh, MPH, SM, SD. University of Massachusetts Medical Center.

Kaumudi J. Joshipura, SM, SD. University of Puerto Rico.

Pagona Lagiou, MD, MS, PhD. University of Athens Medical School, Greece.

K. Malcolm Maclure, SM, SD. Ministry of Health, British Columbia, Canada.

Dominique S. Michaud, SD. Faculty of Medicine, Imperial College, London.

Paola Muti, MD, MSc. Italian National Cancer Institute, Rome.

John D. Seeger, PharmD, MPH, DPH. Ingenix Pharmaceutical Services.

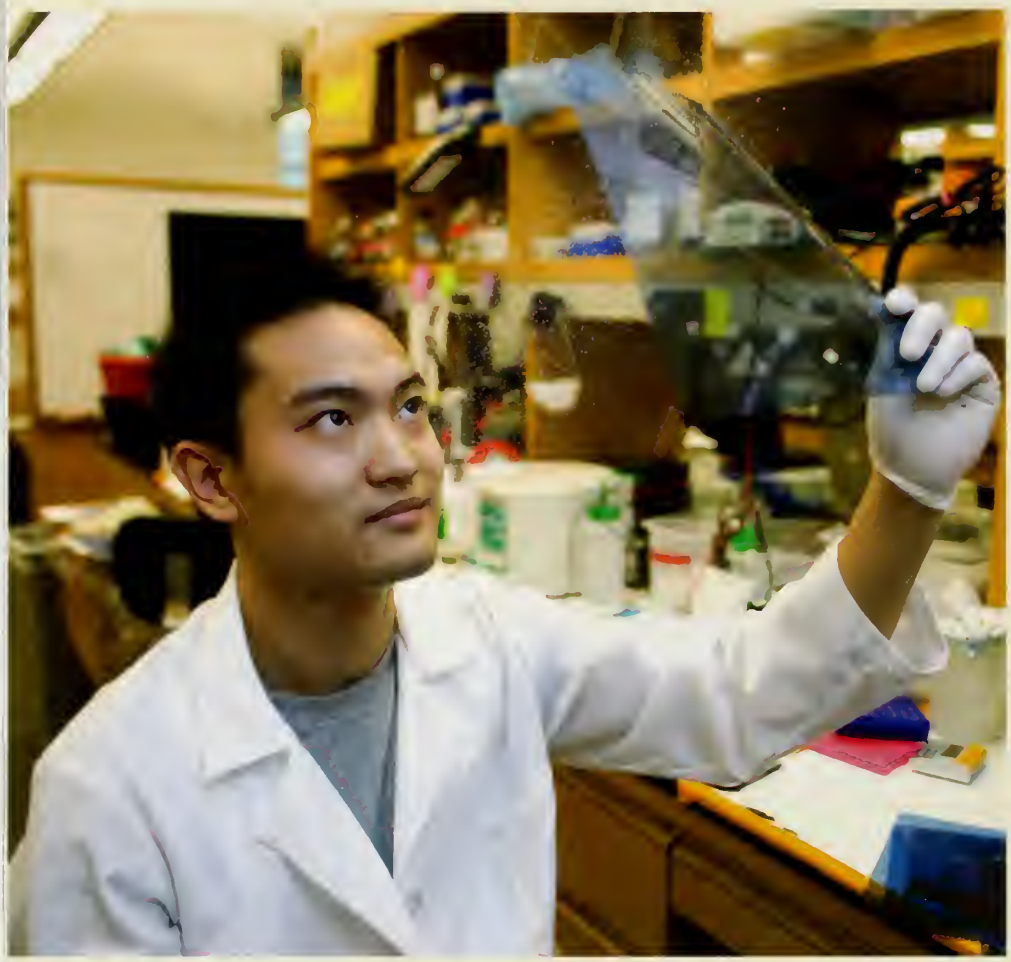
Mark T. Seielstad, PhD. Genome Institute, National University of Singapore.

Ming T. Tsuang, MD, PhD, DSc. University of California, San Diego.

Alexander M. Walker, MPH, MD, DPH. Principal, World Health Information Sciences, Sciences Consultants, LLC.

Department of

GENETICS AND COMPLEX DISEASES



SIHAO LIU

Doctoral student, Department of Genetics and Complex Diseases

A disease focus, particularly on metabolic diseases, is important to Sihao Liu, whose father has diabetes and whose grandfather died from it. "Other programs study interesting molecular pathways, but we ask first if the pathway has an impact on disease," explains Sihao about why Harvard's program appeals to him. "Because of research on metabolism, the outcome has been better for my father."

Sihao grew up in a city in southwest China about double the size of Boston. After two years as a biological sciences major at the China Agricultural University in Beijing, he was one of three students chosen to transfer to an American university. At Cornell he quickly dove into food sciences research and graduated with top honors in 2007.

Determination helped him succeed in this difficult cultural transition. Realizing that "communication of my ideas is as important as good research," Sihao set out to improve his English by watching television. He's only been home twice in his four years in this country, but the fact that he's getting the tools and understanding he needs "pushes me hard."

Working in the laboratory of Assistant Professor Chih-Hao Lee, Sihao is now studying a class of factors that can sense the cell's nutritional status. "There is no better place than Boston to do this disease-related work with so many opportunities to collaborate with people in world-renowned hospitals," he adds. His hope is that one day his research will advance the development of antidiabetes drugs to improve health.

ADAPTATION TO ALTERATIONS IN NUTRIENTS, CHANGES IN LIFESTYLE AND DIETARY EXPOSURES, AND ENVIRONMENTAL FACTORS IS CENTRAL TO HUMAN HEALTH. THE COMPLEX INTERPLAY OF BIOLOGICAL PROCESSES WITH ENVIRONMENTAL FACTORS AS THEY APPLY TO CHRONIC, MULTIGENIC, AND MULTIFACTORIAL DISEASES IS THE EMPHASIS OF THE DEPARTMENT OF GENETICS AND COMPLEX DISEASES.

RESEARCH PROGRAMS IN THE DEPARTMENT focus on molecular mechanisms of adaptive responses to environmental signals to elucidate the mechanisms underlying the intricate interaction between genetic determinants and their divergent responses to stress signals or metabolic input. Alterations in these integrated adaptive mechanisms, central to many devastating disorders such as diabetes, cardiovascular disease, and cancer, have a major impact on the health of human populations worldwide.

The research activities in the Department of Genetics and Complex Diseases and its pre- and postdoctoral training programs concentrate on the molecular, cellular, and organismic adaptations and responses to nutrients, toxins, and radiation stress and explore the genetic and molecular networks controlling these interactions in experimental systems. Programmatic focus is on genetic and mechanistic approaches to biological adaptation. Integrated interdisciplinary opportunities also aim to apply this knowledge to human populations to understand, prevent, and treat complex human diseases.

Faculty research is concentrated within several broad categories, including stress and inflammatory signaling pathways, genetic and epigenetic regulation of chronic inflammation, nutrient sensing and molecular transport, oxidative stress and adaptive stress resistance, hormone action, and metabolic homeostasis, and the role of endoplasmic reticulum dysfunction, nuclear hormone receptors, cell growth and prolifer-

COURSES OF INSTRUCTION

Please note that the courses listed are subject to change and some are not offered every year. Complete course descriptions are available at http://www.hsph.harvard.edu/registrar/ courses.

Metabolic Processes Underlying Complex Diseases

Molecular Basis of Nutritional and Metabolic Diseases

Independent Study, Tutorials

ation, and protein stability. The diseases under study include nutritional and metabolic diseases such as obesity, diabetes, and cardiovascular diseases; cancer; and aging. As most of these health problems emerge as clusters, the translation of research involves multidisciplinary collaborations with faculty members in other HSPH departments and Harvard-affiliated centers, as well as other institutions particularly involved in gene-environment interactions and application of high-density and genomic-based technologies and proteomic approaches to physiological platforms.

Degree Programs in Genetics and Complex Diseases

As described below, the department offers the doctor of philosophy (PhD) program.

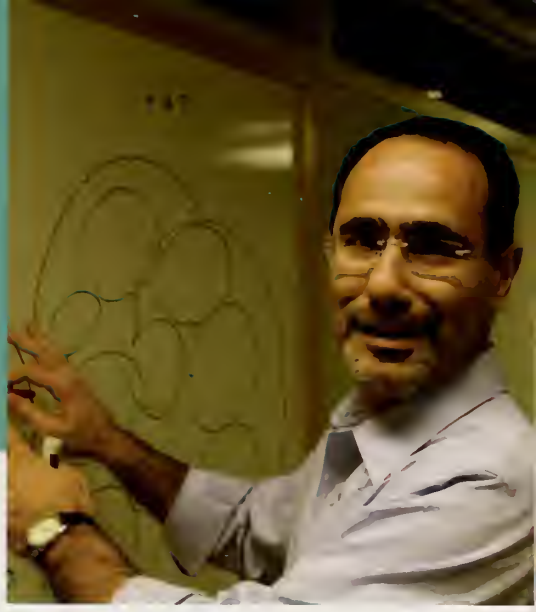
No master of science programs are available.

Doctor of Philosophy in Biological Sciences in Public Health (Genetics and Complex Diseases)

Students wishing to study disease mechanisms and the integrated biology of chronic complex diseases (including metabolic disorders, cancer, and aging) as they pertain to major problems in public health should apply to the PhD program offered by the Division of Biological Sciences through the Harvard University Graduate School of Arts and Sciences. For more information about the PhD program, see page 56.

Contact Information

For more information about research and training in genetics and complex diseases, please contact Julie Gound, director of administration, Department of Genetics and Complex Diseases, 665 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-0054
Fax: 617-432-5236
Email: jgound@hsph.harvard.edu
Web: https://www.hsph.harvard.edu/departments/genetics-and-complex-diseases



For the PhD Program in Biological Sciences in Public Health, online submissions are encouraged, using the Graduate School of Arts and Sciences (GSAS) application form available at the web address below:
Web: http://www.gsas.harvard.edu/hils/admissions_apply.html

DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2009–10.

Department chair: Gökhan S. Hotamisligil, MD, PhD; James Stevens Simmons Professor of Genetics and Metabolism. Molecular basis of metabolic diseases; studies on regulatory pathways; signal transduction in mammalian cells; biology of fatty-acid binding proteins.

Bruce F. Demple, PhD; Professor of Toxicology. Oxidative and free radical damage to DNA and other cellular components; sensing and defense systems to counteract oxidative damage.

Tiffany Horng, PhD; Assistant Professor of Genetics and Complex Diseases. Chromatin biology and epigenetics; transcriptional regulation of inflammation and immune responses.

Chih-Hao Lee, PhD; Assistant Professor of Genetics and Complex Diseases. Energy metabolism regulated by nuclear receptors in immunity and metabolism.

Quan Lu, MS, PhD; Mark and Catherine Winkler Assistant Professor of Lung Biology. Receptor signaling and trafficking; gene-environment interaction; global "loss-of-function" genetic screening.

Brendan D. Manning, PhD; Assistant Professor of Genetics and Complex Diseases. Signal transduction pathways underlying cancer and metabolic diseases.

James R. Mitchell, PhD; Assistant Professor of Genetics and Complex Diseases. Molecular mechanisms of lifespan extension and acute stress resistance by nutritional interventions, including dietary restriction and fasting.

Marianne Wessling-Resnick, MS, PhD; Professor of Nutritional Biochemistry. Genetic disorders of iron metabolism at the molecular level and their implications in complex disease.

Adjunct Faculty

Dieter A. Wolf, MD. Burnham Institute for Medical Research.

Department of
GLOBAL HEALTH AND POPULATION

RIFAT HASAN

Doctoral student, Department of Global Health and Population

"They say that educating a woman is educating her family; the same logic extends to health," says Rifat Hasan of her passion for improving the lives of women and their families around the world. Rifat, whose first job after graduating from Middlebury College was doing laboratory research at the National Institutes of Health, was headed for a career in biochemical research. "But without interaction with patients, I felt removed from the actual goal." Although raised in Ohio, Rifat was born in Bangladesh and visits family there every year. Witnessing the obstacles to high-quality care faced by poor women there motivated her to focus on women's reproductive health instead.

After getting a master of science in the HSPH Department of Society, Human Development, and Health in 2005, Rifat spent two years at the World Bank Group in Washington, DC. She designed an action plan for the government of Rajasthan to provide safe maternal and obstetric care, analyzed global fertility and child health data, and integrated population/reproductive health and development issues into "poverty reduction processes." "The experiences I had with the complexities of global health emphasized that a multidisciplinary approach is essential to be effective on the ground," she says.

She returned to HSPH for doctoral studies because of the multidisciplinary perspective of the Department of Global Health and Population. Hoping to contribute to the evidence base for policymaking, she'll soon be embarking on her dissertation research on the impact of women's reproductive health on household economic status.

THE DEPARTMENT OF GLOBAL HEALTH AND POPULATION SEEKS TO IMPROVE GLOBAL HEALTH THROUGH EDUCATION, RESEARCH, AND SERVICE FROM A POPULATION-BASED PERSPECTIVE.

THE TWENTY-FIRST CENTURY HAS ARRIVED with a complex set of demographic patterns, disease burdens, and health policies. These create challenges that affect all societies, rich and poor, developed and developing. The department's approach to these problems combines the analysis of population and health using quantitative and qualitative methods, the investigation of policies that affect health, and a concern with the politics and ethics of health and development.

The department's faculty members generate knowledge and ideas through their research, strengthen technical and leadership skills through educational programs, and enhance national capacities through collaborative projects, especially in the developing world. In their examination of global health and population issues, department faculty members draw on their disciplinary expertise in many areas: anthropology, biostatistics, demography, ecology, economics, epidemiology, ethics, law, medicine, political science, reproductive biology, and sociology. The department's research interests span a wide spectrum of topics, including social and economic development, health policy, and demography; design and financing of health care systems; women's health and children's health; prevention and control of infectious and chronic diseases; and geographic information systems (GIS). The department has a special concern with questions of health equity and human rights, particularly in relation to health and population issues in developing countries.

Students in the department come with various backgrounds. Many students are from developing countries. All have an interest in the health of disadvantaged populations worldwide.

Degree Programs in Global Health and Population

As described below, the department offers both an 80-credit master of science (SM) program and a program leading to the doctor of science (SD) or doctor of public health (DPH) degree. For information on schoolwide requirements for master's and doctoral degrees, see page 5.

In addition to these programs, the department hosts postdoctoral research fellows and midcareer leaders in international health and undertakes cooperative research and intervention projects overseas.

Master of Science in Global Health and Population

This 80-credit academic program contributes to the improvement of health and population issues around the world by equipping graduates with the analytical and technical skills to address health and population problems at home and abroad from a range of disciplinary perspectives. The program builds a set of advanced competencies covering theoretical and empirical tools and knowledge. Graduates pursue a range of careers in applied research, policy analysis, and practice in global health and in national and international government agencies, NGOs, and the private sector. The degree may also be used as the first step toward doctoral training.

Applicants must hold a bachelor's degree or equivalent in a relevant discipline. Many entering students already hold advanced degrees in medicine or a social science discipline. The admissions committee looks for candidates with strong quantitative skills (as demonstrated, for example, by good performance in college-level mathematics or statistics courses) and for those with relevant prior working experience in international health.

The course work is designed to allow students to take elective courses that will build their skills in several specific areas of their choice. Of the necessary 80 credits, the required core courses make up roughly half, allowing considerable flexibility for students to tailor their own degree programs; 60 credits must be letter-grade credits, including a 5-credit required thesis. The remainder of the credits may be taken pass/fail.

In the first year of study, students focus on the core courses required by the school and the department. The foundation course on global health and population, offered in the first semester, is taken by all students and provides a common platform for the more advanced work that follows. There are approximately 35 required credits in the first year of study, including schoolwide requirements; courses in demography, population health measurement and risk factors, and ethics; and applied courses in politics and economics. In the summer after the first two semesters of instruction, students are expected to develop their ability to apply their skills and knowledge to contemporary problems in international health by undertaking an internship in the United States or abroad. Students often use this internship and the opportunities it provides to gather information for their thesis. In the Winter-Session (January each year), many students join one of the faculty-directed field courses,

COURSES OF INSTRUCTION

Please note that the courses listed are subject to change and some are not offered every year. Complete course descriptions are available at http://www.hsph.harvard.edu/registrar/courses.

Management Control in Health Organizations
Health, Human Rights, and the International System
Health and Human Rights: Concepts and Methods for Public Health
Introduction to Demographic Methods
Health Sector Reform: A Worldwide Perspective
Planning and Evaluation of Health Programs
Human Ecology
Models of Complex Systems in Biology and Public Health
Grant Writing for Funding of Research and Health Care Projects
Ethical Issues in International Health Research
HIV/AIDS in Developing Countries: Epidemiology and National Responses
Field Experience in Health and Human Rights
Applied Politics and Economics I: Political Economy of International Health
Foundations of Global Health and Population
Applied Quantitative Methods I
Pharmaceutical Policy and Global Health
Issues in Health and Human Rights
Microeconomics and Applications to Public Health in Developing Countries
Individual and Social Responsibility for Health
International Health Economics I and II
Field Trip: Health Reform and Community Medicine in Chile
Field Trip: Kerala, India
Research Methods in Population
International Reproductive Health Issues: From Theory to Practice
Determinants of Fertility and Mortality
Applied Qualitative Methods for International Health Research
Sex, Reproduction, and Reproductive Health
Measuring Population Health
Population Health Risk Factors—Introduction and Advanced
Public Health Operations in Complex Emergencies and War
Humanitarian Studies in the Field I and II
Health Policies in Post-Conflict Peacebuilding
Ecology of Health in Development
Econometrics for Health Policy
Geography of Infectious Diseases
Introduction to Global Health Care Delivery
Introduction to Spatial Methods for Public Health
Applied Demography Analysis
Qualitative Inquiry for Health Research
Social, Political, and Economic Dimensions of Infectious Disease in Developing Countries
Field Trip: Urban and Rural Bangladesh
Health System Reforms in China: Seminar and Field Study
Field Trip: Brazil
Field Study on Public Health and Peace Building
Clinical Research in Resource-Limited Settings: Tanzania
International Health and Education
Population Change: Cause and Consequence
Societal Response to Disaster
Ethical Basis of the Practice of Public Health
Introduction to the Practice of International Health
Financing Health Care in Developing Countries
Justice and Resource Allocation
Program Evaluation of Public Health Programs
Ethics and Health Disparities
Managing Community Health Centers
Culminating Experience: MPH-IH Thesis
Business Planning for Health Organizations
Research Methods in Population
Independent Study, Tutorials

which in recent years have included work in Palestine, India, Bangladesh, China, and Chile.

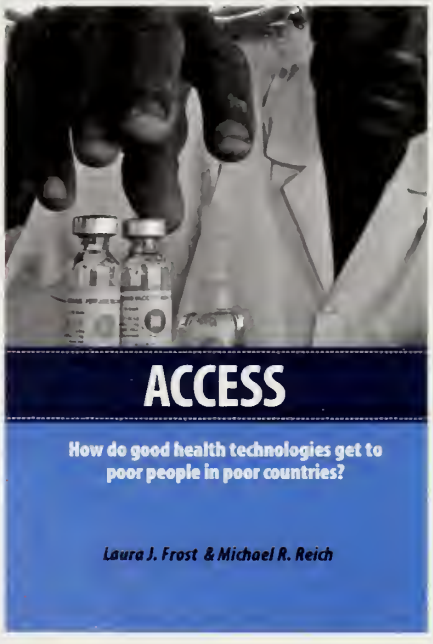
The second year involves a combination of course work and independent study, some linked to the thesis. Individual contracts for independent study with faculty members in the school or the university are encouraged in this second year of study. Many students choose to take courses in other Harvard faculties such as the Harvard Kennedy School or the Harvard Graduate School of Arts and Sciences. Since students have fewer required courses in the second year, they can specialize in areas of their choice.

The instruction provided through courses, field visits, and individual or small-group teaching is largely based on the firsthand current research experience of the faculty, who work on a range of applied and theoretical problems in global health and population. The graduating student thus has a solid and up-to-date understanding of the major issues in population and global health; the tools to examine evidence related to program effectiveness, priority setting, and decision making; and insights into the practical aspects of undertaking population health interventions around the world, including a perspective on the economic, social, political, and ethical considerations that bear on these issues.

Doctor of Science in Global Health and Population/Doctor of Public Health

The doctoral programs are designed to prepare students both for academic careers in universities or research institutions and for professional leadership positions in the public or private sectors of public health. Recent graduates have taken positions with the Centers for Disease Control and Prevention, the World Bank, and nongovernmental organizations and have assumed postdoctoral and teaching positions with universities in the United States and around the world.

Desired applicants have outstanding academic records, substantial relevant experience in the international public health arena, and research interests relevant to the department. Applicants to the DPH program must have or be in progress toward an MPH and must also hold an advanced degree in a basic public health discipline. Students without sufficient training are encouraged to enter the department's 80-



credit master's degree program and to apply to enter the doctoral program at a later date. Entry to the doctoral program will then depend upon outstanding performance in the master's degree program and acceptance through the regular admissions process of the doctoral program.

In addition to schoolwide requirements in biostatistics and epidemiology, doctoral students must complete a common core of course work with a focus on global health. Core courses cover economics, ethics, politics, quantitative and qualitative methods, and population health measurement. The second year of the doctoral program usually involves both course work and research planning.

Applicants to the doctoral program must select one of three areas of interest currently offered by the department: economics, health systems, or population and reproductive health. The selected area becomes the student's required major for the doctoral program. Although course requirements for a specific area of interest may be taken concurrently with the core, the majority of these will be taken during the second year of study. Students are also required to select two minor fields from the department or from allied departments of the school or university, including the HSPH Departments of Biostatistics, Epidemiology, Immunology and Infectious Diseases, Nutrition, or Society, Human Development, and Health.

The three areas of interest offered by the department are described below:

Economics The economics area of interest is designed to give students a strong foundation in microeconomic theory and to develop their skills in applying economic analysis to global health and population issues. In addition to economic theory and econometrics, students will study recent empirical economic research related to global health and population. As well as courses at HSPH, students are expected to take advanced courses in economics in the Department of Economics in the Faculty of Arts and Sciences and at the Kennedy School. The rigorous training provided in this area of interest, together with interdisciplinary training in other areas, will allow students to undertake their own research using economic models of behavior.

Research topics that might be pursued within the economics area of interest include the costs and benefits of public health interventions, the effect of poverty and social deprivation on health, the impact of health improvements on the economy, the effect of government regulation on market structures and private health care provision, mechanisms for developing new drugs and treatments, and the effect of family size on child poverty and health.

Health systems This area of interest trains students to apply a multidisciplinary approach to advance research on health care systems. The goal is to improve equity, health outcomes, and the efficiency of health systems. Study in this area rests on three intellectual disciplines—political economy, evaluation sciences, and ethics—and emphasizes making evidence-based policies. Courses provide knowledge to improve the design, strategy, implementation, and evaluation of health systems around the world, particularly in middle- and lower-income countries. Students learn to integrate theories of economics, political science, political economy, and ethics and to apply them to the critical international health system issues of the day. Through extensive course work in program evaluation, students apply methods to assess the performance of health systems or programs.

Research topics include deterministic models of health systems performance; political economy of health system reform; design of systems to improve the equity, effectiveness, and efficiency of health care; reform of financing, organization, and incentive structures to improve systems' performance; evaluation of the impacts of system reforms; and the design and evaluation of social experiments to achieve social goals.

Population and reproductive health This area of interest prepares students for independent research on population health issues worldwide. Through required courses, seminars, and independent study, this area provides a solid foundation in the essential demographic, epidemiologic, and statistical concepts and methods needed for

the analysis of levels, trends, and differentials in population health and its determinants. A key element of the training is a grounding in methods for the measurement of fertility, mortality, and morbidity levels and their biological, environmental, and behavioral determinants, including health risk factors, all at the population level. Several courses illustrate the way in which methods and models based on demographic estimation techniques and epidemiologic relationships can be applied to new challenges in national, regional, and global burden of disease assessments. The training is strongly quantitative, with an emphasis on analytical techniques, but some competence in the application of qualitative methods and an understanding of the broader socioeconomic theories of population health is also expected, depending on the dissertation topic.

Students within this area have recently written dissertations on such topics as HIV/AIDS in Tanzania; sexual behavior and the epidemic of HIV/AIDS in informal settlements in Capetown, South Africa; gender-based violence and reproductive health in Jordan; risk factors for the global and national burden of chronic diseases; fertility and induced abortion in Ghana; and intergenerational factors in child growth and health in rural Africa.

RELATED OFFERINGS

Interdisciplinary concentration in maternal and child health/children, youth, and families, see page 57.
Interdisciplinary concentration in the epidemiology of infectious disease, see page 58.
Interdisciplinary concentration in women, gender, and health, see page 58.
MPH concentration in international health, see page 54.

Postdoctoral Fellowships

The Takemi Program in International Health offers postdoctoral fellowships for professionals and scholars from around the world for research and advanced, interdisciplinary training on critical issues of international health, especially those related to developing countries. Takemi fellows are typically mid- to senior-level health professionals who spend the year working on a particular research topic. The program addresses problems of mobilizing, allocating, and managing scarce resources to improve health, and of designing strategies for disease control and health promotion. The program does not provide funding. Applicants are encouraged to identify their own sources of support for the fellowship.

Contact Information

For general information about the Department of Global Health and Population, please contact the department at 665 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-1232
Fax: 617-432-6733

For more information about master's and doctoral programs in global health and population, please contact the Education Office, Department of Global Health and Population, at the address above, or visit the department website.
Phone: 617-432-2253
Fax: 617-432-6733
Email: ajaimung@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/Academics/pih/index.htm

For more information about the Takemi Program in International Health, please contact the program coordinator, Department of Global Health and Population, 665 Huntington Avenue, Boston, MA 02115, or visit the program website.
Phone: 617-432-0686
Fax: 617-432-1251
Email: takemi@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/research/takemi

DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2009–10.

Department chair: David E. Bloom, MA, PhD; Clarence James Gamble Professor. Applied economics: labor, population, health, education, and development; demography; global health; international education.

Till W. Bärnighausen, MD, MSc, MSc, ScD; Assistant Professor of Global Health. HIV in sub-Saharan Africa; health systems in developing countries; population health.

Lisa F. Berkman, MS, PhD; Thomas D. Cabot Professor of Public Policy and of Epidemiology. Social epidemiology; population health; epidemiology of aging.

Theresa S. Betancourt, MA, SD; Assistant Professor of Child Health and Human Rights. Developmental and psychosocial consequences of concentrated adversity on children and families; resilience and protective processes in child development; child health and human rights; applied cross-cultural mental health research.

Barry R. Bloom, PhD; Joan L. and Julius H. Jacobson Professor of Public Health, and Harvard University Distinguished Service Professor. Mechanisms of resistance and pathogenesis of diseases in developing countries, particularly tuberculosis and leprosy; genetic analysis of host resistance; development of genetically engineered vaccines against tuberculosis.

Thomas J. Bossert, MA, PhD; Lecturer on Global Health Policy. Decentralization of health systems; political process of health reform; interventions to increase social capital; reforms of public health ministries.

Claude Bruderlein, Lic.en Droit, LLM; Lecturer on International Health. Strategic planning and program evaluation; human rights and humanitarian law; protection of civilians in war; role of international institutions in humanitarian intervention.

Paul H. Campbell, MPA, SD; Lecturer on Management. Emergency preparedness; community health centers; management issues in low-income countries.

David J. Canning, PhD; Professor of Economics and International Health. Interaction between health, population, and economic development.

Richard A. Cash, MD, MPH; Senior Lecturer on International Health. Link between infectious diseases and impact on political, social, and economic conditions, primarily in developing countries; ethical issues in global health research; public health education in developing countries.

Marcia C. Castro, MA, PhD; Assistant Professor of Demography. Population dynamics and demographic methods; mortality and morbidity; malaria transmission and control; environmental change and health; spatial methods applied to social sciences; Amazon frontier expansion.

Jessica Lee Cohen, PhD; Assistant Professor of Global Health. Maternal and child health; human resources for health; impact evaluation of health and development policies; randomized trials.

Norman Daniels, MA, PhD; Mary B. Saltonstall Professor of Population Ethics and Professor of Ethics and Population Health. Justice, health, and health policy, specifically issues of resource allocation, health disparities, access to risk reduction and forms of health care, and insurance coverage; health technology assessment.

Majid Ezzati, MEng, MA, PhD; Associate Professor of International Health. Environmental health in developing countries; energy, air pollution, and health; risk assessment; population health; global health; technology policy.

Wafaie W. Fawzi, MBBS, MPH, SM, DPH; Professor of Nutrition and Epidemiology. Etiologies of infectious diseases and perinatal conditions with emphasis on dietary and nutritional causes; dietary factors in disease in pregnancy and childhood.

Günther Fink, PhD; Assistant Professor of International Health Economics. Development economics; health economics; human and health capital.

Julio Frenk, MD, MPH, MA, PhD; T & G Angelopoulos Professor of Public Health and International Development in the Harvard School of Public Health and Harvard Kennedy School and Dean of the Faculty of Public Health. Comparative analysis of health systems; national health policy; globalization and health.

Sofia M. Gruskin, JD, MIA; Associate Professor of Health and Human Rights. Conceptual, methodological, policy, and practice implications of linking health to human rights with particular attention to HIV/AIDS, women, children, gender issues, and vulnerable populations.

Daniel T. Halperin, MS, PhD; Lecturer on International Health. Heterosexual transmission of HIV and other sexually transmitted infections, including previously neglected co-factors.

Allan G. Hill, PhD; Andelot Professor of Demography. Health, mortality, and fertility health transitions and their determinants in the Arab World and West Africa; measuring the impact of health interventions; population health status and differentials; women's health; geographical differentials in urban health.

Kenneth Hill, PhD; Professor of the Practice of Global Health. Measurement of population health outcomes in developing countries; interpretation of differences between populations or changes over time within populations.

William C. Hsiao, MPA, PhD; K.T. Li Professor of Economics. Health systems studies; payments and incentive structures; national health insurance.

Jennifer Leaning, SM, MD; Professor of the Practice of Global Health. Medical human rights and international law; complex humanitarian emergencies; medical triage in war and disasters; environmental effects of war.

Richard Levins, PhD; John Rock Professor of Population Sciences. Public health and agricultural ecology; evolution; qualitative mathematical modeling; complexity and philosophy of science; special interest in Latin America.

Yuanli Liu, MD, MPH, SM, PhD; Senior Lecturer on International Health. Innovative ways to make health systems in developing countries more equitable and efficient; health and pharmaceutical policy; international comparison of health systems; financing and organization.

Ajay Mahal, MS, PhD; Associate Professor of International Health Economics. Health financing and health systems research; economics of HIV and AIDS; health policy in India.

Stephen P. Marks, Doctorat d'état; François-Xavier Bagnoud Professor of Health and Human Rights. Health and human rights; international law; development economics; international trade; Cambodia; civil society; biotechnology; terrorism; cultural rights; tobacco control; access to essential drugs.

Marc D. Mitchell, MD, MS; Lecturer on International Health. Development and validation of clinical standards; use of mobile technology to improve quality of care.

Michael R. Reich, AM, PhD; Taro Takemi Professor of International Health Policy. Political economy of health, population, and development; pharmaceutical policy and global health.

Marc J. Roberts, PhD; Professor of Political Economy. Health sector reform around the world; public health ethics; pharmaceutical policy; ethics of disaster management.

Joshua A. Salomon, PhD; Associate Professor of International Health. Priority setting in global health; health measurement and valuation; evaluation of impact and cost-effectiveness of health programs and interventions.

Daniel Wikler, PhD; Mary B. Saltonstall Professor of Population Ethics and Professor of Ethics and Population Health. Bioethics; ethical issues in population health and global health; ethical issues in research with human subjects; ethical issues in health resource allocation; responsibility for health.

Secondary Appointments

(primary appointments at Harvard Medical School or Kennedy School of Government)

Jonathan L. Burstein, MD; Assistant Professor in the Departments of Global Health and Population and Health Policy and Management. Emergency medicine in the field, hospitals, and disaster situations.

Michael J. VanRooyen, MD, MPH; Associate Professor in the Department of Global Health and Population. Research in accountability, effectiveness, and quality assurance in humanitarian operations in conflict and disaster.

Mary E. Wilson, MD; Associate Professor in the Department of Global Health and Population. Emerging infectious diseases.

Grace Wyshak, SM, PhD; Associate Professor in the Departments of Biostatistics and Global Health and Population. Global and national health, primarily women's health; cancer; osteoporosis; psychiatry; obstetrics; HIV/AIDS.

Adjunct Faculty

Peter A. Berman, MSc, PhD. World Bank.

Saidi H. Kapiga, MD, MPH, SD. London School of Hygiene and Tropical Medicine.

Joel H. Lamstein, SM. John Snow, Inc.

Ulla M. Larsen, MA, MA, PhD. University of Maryland.

Adetokunbo O. Lucas, MBBS, DPH, SM, MD. Consultant.

Christopher J. L. Murray, MD, DPhil. University of Washington.

M. Omar Rahman, MD, MPH, SD. Independent University of Bangladesh.

Gita Sen, MA, PhD. Indian Institute of Management, Bangalore, India.

Winnie Chi-Man Yip, PhD. Oxford University.

Department of

HEALTH POLICY AND MANAGEMENT

THE DEPARTMENT OF HEALTH POLICY AND MANAGEMENT IS A MISSION-ORIENTED DEPARTMENT CONCERNED WITH IMPROVING THE HEALTH CARE DELIVERY SYSTEM AND MITIGATING PUBLIC HEALTH RISKS IN THE UNITED STATES AND ABROAD.

THE DEPARTMENT IS DEDICATED TO resolving major management and health policy problems through original research, advanced training, and dispute resolution. Research priorities in the Department of Health Policy and Management are organized into nine broad areas:

- health financing and insurance, including the creation of new physician payment systems and the design of public policies dealing with rising insurance premiums
- management of health hazards, including use of risk assessment to set priorities for environmental health protection
- study of the causes and etiology of injury and the application of that work to the development and evaluation of prevention and intervention strategies and policy
- management of health care organizations, encompassing the application of corporate strategic-planning concepts to the challenges faced by health systems and pharmaceutical firms
- evaluation and management of medical technology, including the meta-analysis of data from clinical trials
- business and labor in health, including the negotiation of occupational safety and health care benefits in the collective-bargaining process
- international health, including evaluation of the cost-effectiveness of health programs in developing countries

MICHAELA KERRISSEY

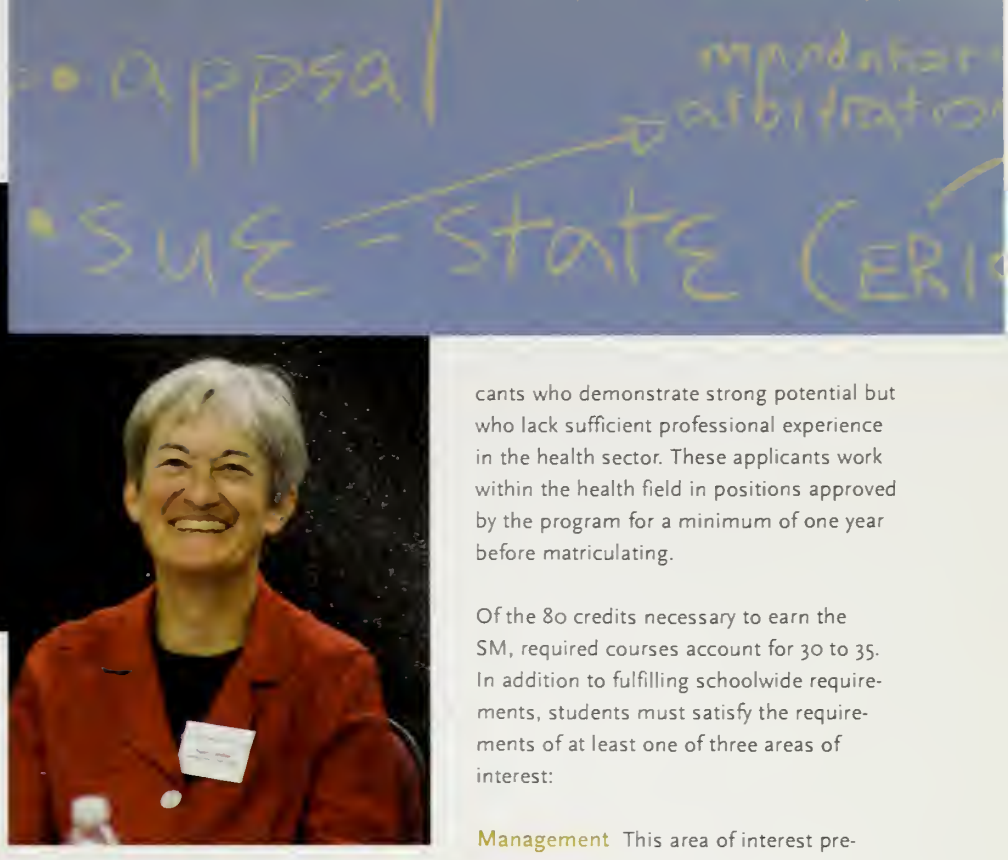
Master of science student, Department of Health Policy and Management

"Blaring radios, baskets of mangos, laughter, car exhaust, polio survivors crossing streets on twisted knees. The earth is red, the sky dazzles, and the buildings crumble." This is how Michaela Kerrissey—an award-winning poet—described Kampala, Uganda, where she spent the past three years developing innovative, community-based public health programs. She believes her greatest accomplishment there was developing a groundbreaking prevention program that targeted couples where only one partner was HIV-infected.

Michaela went to Uganda after graduating from Duke University, where she focused on community engagement projects as a Robertson scholar, a merit-based program for future leaders committed to social change. As part of this program, she traveled to countries like Cuba and South Africa to learn about community development. These experiences sparked her interest in public health and ultimately led her to HSPH.

"Coming to HSPH has been an eye-opening experience," says Michaela. "My fieldwork was valuable, but when you're elbow deep in your work, you concentrate on the specific project at hand rather than how the health system as a whole is organized."

Recognizing the importance of effective national health policies and evidence-based programs, Michaela has focused her course work on system-level issues. Her classes have broadened her perspective, she says, and will be of great benefit when she returns to work in sub-Saharan Africa upon graduation. Currently she is writing a book on her Uganda experiences and is forming a social enterprise to address the unmet public health challenge of road safety there.



- quality of health care, encompassing the design of better methods to measure quality

- health care reform, involving the development of partnerships between the department and the corporate community to explore critical aspects of health policy and management

The department's problem-solving orientation is exemplified by its strong ties to leading health practitioners in hospitals, managed-care plans, community health centers, health advocacy groups, corporate medical departments, health and environmental consulting firms, state and local health departments, legislative committees, federal regulatory agencies, and international agencies. Practical skills are emphasized by an interdisciplinary faculty that includes management specialists, decision analysts, accountants, physicians, lawyers, policy analysts, economists, political scientists, and program evaluators.

Degree Programs in Health Policy and Management

As described below, the department offers both 80-credit and 42.5-credit master of science (SM) programs, a nonresidential, part-time SM in health care management for physician and dental executives, and a doctor of science (SD) program. The department also participates in the university-wide doctor of philosophy (PhD) Program in Health Policy. For information about schoolwide requirements for master's and doctoral degrees, see page 5.

Master of Science in Health Policy and Management (80-credit and 42.5-credit programs)

The 80-credit SM program is designed for students who are building professional careers in health-related fields and who aspire to leadership roles. The program emphasizes professional skills and concepts; a solid grounding in the substance of health problems; rigorous quantitative training; and a curriculum that combines professional, academic, and practice activities. Acquired knowledge is applied to practical situations through a required summer internship program and a field research project. Recent graduates have taken positions in local, state, and federal government agencies; consulting companies; public policy research organizations; community health centers; hospitals; health plans; and pharmaceutical companies. Others have gone on to doctoral and fellowship programs.

Applicants to the 80-credit program come from a wide variety of undergraduate fields. They are expected to have full-time work experience and an academic record, particularly in quantitative and analytical courses, that suggest outstanding potential in the areas of health policy and management. Applicants should have at least two years of relevant postbaccalaureate work experience in the health field; exceptions are occasionally made for outstanding candidates. Deferred admission is available for applicants who demonstrate strong potential but who lack sufficient professional experience in the health sector. These applicants work within the health field in positions approved by the program for a minimum of one year before matriculating.

Of the 80 credits necessary to earn the SM, required courses account for 30 to 35. In addition to fulfilling schoolwide requirements, students must satisfy the requirements of at least one of three areas of interest:

Management This area of interest prepares students for managerial and leadership positions in health care organizations, such as hospitals, sub-acute and long-term care facilities, physician practices, insurers, community health centers, and consulting companies.

Policy This area of interest is intended for those who wish to become involved in the formulation of health policy, including medical care policy, heath finance and insurance, access to health care, payment to institutions and practitioners, political analysis and strategy, and Medicare and Medicaid reform.

Research This area of interest is geared toward students looking toward doctoral education and research careers in fields such as health economics, quality of care, technology assessment, health decision analysis, and advanced statistical analysis.

The requirements for the management, policy, and research areas of interest are described in a guide available from the department. After the required credits have been completed, students are encouraged to enroll in relevant courses at Harvard Business School, Harvard Kennedy School, and Harvard Graduate School of Education.

The 42.5-credit SM program is designed for students pursuing research careers in public- or private-sector health care institutions, particularly physicians and other candidates

COURSES OF INSTRUCTION

Please note that the courses listed are subject to change and some are not offered every year. Complete course descriptions are available at http://www.hsph.harvard.edu/registrar/courses.

Economic Analysis
Economic Analysis for Public Health
Health Care Regulation and Planning
Economics for Health Policy
Program Evaluation
Public Health Law
Financial Transactions and Analysis
Financial Management and Control
Financial Management of Health Care Organizations
Public Speaking for Managers
Economics of Health Policy
Introduction to the New American Health Care System: Law, Policy, and Management
Managing Health Care Costs
Community Organizing for Health
Managing People in Health Care Organizations
Competitive Strategy
Operations Management in Service Delivery Organizations
Strategic Marketing Management in Health Systems
Health Economics: Economic Analysis of the Health Care System
Public Health Leadership Skills
Seminar in Health Policy
Improving Quality in Health Care
Payment Systems in Health Care
Health Policy Issues: Access to Dental Services
Methods and Application in Health Services Research
Current Issues in Health Policy
Skills and Methods of Health Care
Negotiation and Conflict Resolution I and Advanced
Applied Research and Practice in Health Policy and Management
Research Ethics
Doctoral Seminar in Health Economics
Research with Large Databases
Introduction to Management of Health Care Organizations
Medical Informatics
Health Care: Quality Improvement
American Violence: The Intersection Between Home and Street
Health Information Technology and Its Impact on Health Care
Organizing Consumer and Community Interests in the Health System
Disparities in Health
Principles of Suicide Prevention
Measuring and Analyzing the Outcomes of Health Care
Information Technology and Chronic Disease Management
Leading Change
Public Health Response to Mass Emergencies
Health Care Organizations and Behavior
Medical Malpractice and Risk Management
Theory and Practice of Effective Leadership
Law and Public Health
Principles of Injury Control
Politics and Strategies for Change in Health Policy
Ethical Basis of the Practice of Public Health
Ethical Basis of the Practice of Public Health: Health Care Delivery
Practice of Health Care Management and Policy
Oral Health Policy Research Seminar
Theory and Practice of Public Health in the United States
Managing Community Health Centers
Business Planning for Health Organizations
Pharmacoeconomics
Decision Analysis for Health and Medical Practices
Cost-Effectiveness and Cost-Benefit Analysis for Health Programs Evaluations
Decision Theory
Decision Analysis Methods in Public Health and Medicine
Foundations in Public Health
Decision Analysis in Clinical Research
Research Seminar on Risk and Decision Analysis
Methods for Decision Making in Medicine
Independent Study, Tutorials

with relevant advanced degrees who desire intensive training in analytic and quantitative skills. The degree is appropriate for students interested in either domestic or international research questions. Recent graduates have taken research positions at academic medical centers and other health care organizations.

Applicants to the 42.5-credit program should hold graduate medical or other professional degrees and have significant experience in health services. They typically expect to devote a substantial portion of their careers to research in areas such as health services research, cost-effectiveness analysis, and clinical decision making.

Students fulfill schoolwide requirements and take up to 10 tutorial credits and an additional 10 credits in courses within the department. Recommended electives include upper-level courses in biostatistics, epidemiology, health economics, health services research, health decision sciences, quality improvement, technology assessment, and program evaluation.

Master of Science in Health Care Management

The SM in health care management is a 42.5-credit, two-year, part-time, nonresidential degree program that trains clinicians in the executive skills required for management. This professional program is for mid-career MDs, DOs, DMDs, and DDSs with significant management responsibilities who wish to be more effective in their roles in the health care sector.

The program includes course work on strategy determination, financial analysis, negotiation, organizational behavior, operations management, information systems, and quality-of-care management. Degree candidates are required to spend three weeks each summer on campus, as well as five four-day weekends (Friday through Monday) each academic year. Participants should expect ten to fifteen hours per week of assignments when not on campus. A final practicum and quality improvement field project are also required.

This is a closed-cohort learning situation. Attendance at all sessions is mandatory, and previous courses and/or degrees will not be applied to degree requirements. No auditing or cross-registration is allowed.

Doctor of Science in Health Policy and Management

The SD program in health policy and management is designed for physicians, lawyers, and other professionals who are interested in doctoral-level research training in health policy and who are committed

to applied, interdisciplinary research. The program prepares graduates to perform research in the academic or professional realm.

Applicants should hold an MD, a DDS, a PhD, or a JD degree. Except in rare cases the department also expects that applicants will be in progress toward or will have already obtained a degree at HSPH. Moreover, applicants should have a strong aptitude in a quantitative discipline (demonstrated by prior academic performance, work experience, and standardized test scores), experience in the health sector, and the ability to perform original and independent work. Applicants should indicate their anticipated area of interest within the department and anticipated faculty mentor in their application. An environmental science and risk management area of interest is offered jointly with the Department of Environmental Health.

In addition to schoolwide requirements, candidates complete a set of required courses in decision science, economics, program evaluation, health politics, and public health law (lawyers only). Each student works closely with a faculty adviser to develop an individual plan of study. While students in this program have the opportunity to take courses throughout the university, all required courses are offered through HSPH.

Doctor of Philosophy in Health Policy

The doctor of philosophy in health policy is a collaborative program of six Harvard University faculties: the Graduate School of Arts and Sciences, School of Public Health, Medical School, Kennedy School, Law School, and Business School. Because this is an interfaculty program, enrolled students take courses throughout the university. The PhD is awarded by the Faculty of Arts and Sciences. Please note that Graduate School of Arts and Sciences application forms must be used when applying to the PhD Program in Health Policy. The deadline for applying to the PhD program is December 15, 2009.

The program prepares students for tenure-track positions and other research positions at schools of public health, public policy, and medicine; organizations such as the Kaiser Family Foundation, the RAND Corporation, the World Health Organization, and Memorial Sloan-Kettering Cancer Center; and government agencies such as the Congressional Budget Office and the Centers for Disease Control and Prevention.

Applicants wishing to combine the PhD Program in Health Policy with either the MD program at Harvard Medical School or the JD program at Harvard Law School must apply separately to each program and indicate in the PhD application that they are also applying to the MD or JD program.

Applicants must submit GRE or GMAT exam scores that are less than five years old, and individuals whose native language is not English must submit TOEFL scores. A graduate degree is not required for admission; however, with the possible exception of applicants wishing to pursue a combined degree (see above), preference is given to those with either relevant work experience or some prior graduate work.

Degree requirements include approximately two years of course work; a concentration in one academic discipline (decision science, economics, ethics, evaluative science and statistics, management, medical sociology, or political analysis); at the dissertation stage specialization in one of five policy areas (environmental health, health care services, international health, mental health, or public health); general and concentration exams (usually at the end of the second year); a dissertation prospectus and oral examination; a dissertation based on original research; and a dissertation defense.

Financial aid is available to applicants admitted to the program. Financial aid (tuition for five years and a stipend for three years) is available for admitted minority students with demonstrated need. Traineeships for some admitted students are also

provided from funding sources such as the Agency for Healthcare Research and Quality and the National Institute of Mental Health.

Contact Information

For more information about SM and SD programs in health policy and management, please contact Anne Occhipinti, director of academic programs, Department of Health Policy and Management, 677 Huntington Avenue, Boston, MA 02115, or visit the department website.
Phone: 617-432-4511
Fax: 617-432-3699
Email: aocchipi@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/academics/hpm

For more information about the SM degree in health care management, please contact Colin Fleming, senior coordinator, Department of Health Policy and Management, 677 Huntington Avenue, Boston, MA 02115, or visit the department website.
Phone: 617-432-7075
Email: cfleming@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/mhcm

For the PhD program online submissions are encouraged, using the Graduate School of Arts and Sciences application form available at the web address below:
Web: https://apply.embark.com/grad/Harvard/GSAS

For specific information about the PhD program, please contact Debbie Whitney, associate director, PhD Program in Health Policy, 14 Story Street Street, 4th Floor, Cambridge, MA 02138, or visit the program website.
Phone: 617-496-5506
Fax: 617-496-2860
Email: deborah_whitney@harvard.edu
Web: http://www.healthpolicy.fas.harvard.edu

DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2009–10.

Department chair: Arnold M. Epstein, AM, MD; John H. Foster Professor of Health Policy and Management. Applying the paradigm and methodologies of economics and other social sciences to clinical medicine.

Katherine Baicker, PhD; Professor of Health Economics. The financing of health insurance; health care disparities; spending on public programs and fiscal federalism.

Robert J. Blendon, MBA, MPH, DS; Professor of Health Policy and Political Analysis. Health policy and political analysis; public opinion; national emergency preparedness.

Paul H. Campbell, MPA, SD; Lecturer on Management. Emergency preparedness; community health centers; management issues in low-income countries.

Susanne J. Goldie, MD, MPH; Roger Irving Lee Professor of Public Health. Decision science; mathematical models; cost-effectiveness analysis; resource allocation; health systems; infectious causes of cancer; vaccine-preventable disease; maternal mortality.

James K. Hammitt, SM, MPP, PhD; Professor of Economics and Decision Sciences. Economics; decision sciences; risk analysis; information and uncertainty.

David Hemenway, MA, PhD; Professor of Health Policy. Injury and violence prevention; microeconomics.

William C. Hsiao, MPA, PhD; K.T. Li Professor of Economics. Health systems studies; payments and incentive structures; national health insurance.

Ashish K. Jha, MD, MPH; Associate Professor of Health Policy and Management. Quality of care provided by health care systems, with two focus areas: health care disparities as a marker of poor quality of care and HIT as a potential solution for improving care.

Nancy M. Kane, MBA, DBA; Professor of Management and Associate Dean for Educational Programs. Nonprofit hospital governance; community benefit and financial performance metrics for nonprofit health care organizations; delivery system payment reform.

Jack Kasten, MPH, JD; Lecturer on Health Services. Managed care; service utilization; manpower issues; hospital organization and management.

Jane J. Kim, SM, PhD; Assistant Professor of Health Decision Science. Mathematical modeling and cost-effectiveness analysis to inform resource allocation decisions; calibration of disease simulation models; women's health and mental health.

Howard K. Koh, MD, MPH; Professor of the Practice of Public Health. Community-based strategies to reduce cancer disparities; tobacco control programs, secondhand smoke exposure; melanoma/skin cancer control; bioterrorism; pandemic influenza; emerging health threats.

Jonathan I. Levy, SD; Mark and Catherine Winkler Associate Professor of Environmental Health and Risk Assessment. Air pollution exposure assessment and risk assessment; health impact assessment of power plants and transportation sources.

Leonard J. Marcus, MSW, PhD; Lecturer on Public Health Practice. Meta-leadership for emergency preparedness and response; crisis leadership; health care/public health negotiation and conflict resolution; public health leadership; mediation for health care disputes.

Michelle M. Mello, MPhil, PhD, JD; Professor of Law and Public Health. Empirical analysis of health law issues; medical malpractice litigation; medical errors and patient safety; pharmaceuticals; ethics.

Matthew J. Miller, MD, MPH, SD; Associate Professor of Health Policy and Management. Suicide prevention; injury prevention; violence prevention; health policy; epidemiology; pharmacoepidemiology; medical ethics; clinical trials.

Joseph P. Newhouse, PhD; John D. MacArthur Professor of Health Policy and Management. Financing and organization of medical care; medical malpractice; manpower policy; outcomes research.

R. Heather Palmer, MBBCh, SM; Professor of Health Policy and Management. Quality in health care, including quality measurement and improvement; primary care.

Howard L. Rivenson, MBA, PhD; Lecturer on Health Management. Accounting and financial management of health care organizations; community health centers; governance of health care organizations.

RELATED OFFERINGS

Environmental science and risk management area of interest, Department of Environmental Health, see page 12.
Interdisciplinary concentration in the epidemiology of infectious disease, see page 58.
MPH concentrations in health care management and policy and in law and public health, see page 54.

Marc J. Roberts, PhD; Professor of Political Economy. Health sector reform around the world; public health ethics; pharmaceutical policy; ethics of disaster management.

Meredith Rosenthal, PhD; Associate Professor of Health Economics and Policy. Health economics; physician payment; pharmaceutical policy; health care quality; patient incentives.

Sara J. Singer, MBA, PhD; Assistant Professor of Health Care Management and Policy. Application of organizational safety, organizational learning, and leadership theories to understand and improve the quality, safety, and efficiency of health care organizations.

Katherine Swartz, MS, PhD; Professor of Health Policy and Economics. Populations without health insurance; health insurance markets; aging-population issues.

Nancy Turnbull, MBA; Senior Lecturer on Health Policy and Management and Associate Dean for Educational Programs. Health insurance; insurance regulation; expansion of health coverage.

Milton C. Weinstein, AM, MPP, PhD; Henry J. Kaiser Professor of Health Policy and Management. Medical decision science; cost-effectiveness analysis; health care technology assessment.

Secondary Appointments

(primary appointments at Harvard Medical School)

John Z. Ayanian, MD, MPP; Professor in the Department of Health Policy and Management. Impact of gender, race, insurance coverage, and socioeconomics on access to care and clinical outcomes.

David W. Bates, MD, SM; Professor in the Department of Health Policy and Management. Clinical decision making and physician behavior; quality of care and cost-effectiveness; outcome assessment.

Donald M. Berwick, MPP, MD; Professor in the Department of Health Policy and Management. Health care quality assessment, management, and improvement; technology assessment and cost-effectiveness analysis; decision analysis and clinical epidemiology.

Paul D. Biddinger, MD; Assistant Professor in the Department of Health Policy and Management. Public health preparedness for disasters; use of simulation exercises for adult learning and measurement of performance.

Jonathan L. Burstein, MD; Assistant Professor in the Departments of Global Health and Population and Health Policy and Management. Emergency medicine in the field, hospitals, and disaster situations.

David J. Cohen, MD, SM; Associate Professor in the Department of Health Policy and Management. Application of health outcomes research and cost-effectiveness analysis to interventional cardiology.

Craig C. Earle, MD, MSc; Associate Professor in the Department of Health Policy and Management. Quality-of-care assessment; cancer survivorship; economic evaluation.

Kenneth A. Freedberg, MD, SM; Associate Professor in the Department of Health Policy and Management. Decision analysis; cost-effectiveness analysis; clinical epidemiology and outcomes research; HIV disease.

Atul A. Gawande, MA, MD, MPH; Associate Professor in the Department of Health Policy and Management. Reduction of errors and complications in surgery; global provision of surgical care; narratives from medicine.

G. Scott Gazelle, MD, MPH, PhD; Professor in the Department of Health Policy and Management. Technology assessment; health services research.

Thomas A. Gaziano, MD, MSc; Assistant Professor in the Department of Health Policy and Management. Development of decision analytic models to assess the cost-effectiveness of various screening, prevention and management decisions, including in developing countries.

Robert A. Greenes, MD, PhD; Professor in the Department of Health Policy and Management. Biomedical informatics; knowledge management and decision support strategies for enhancing quality and safety of health care.

Allen B. Kachalia, JD, MD; Assistant Professor in the Department of Health Policy and Management. Patient safety; medical malpractice reform; and legal issues in medicine.

Thomas H. Lee, Jr., MD, SM; Professor in the Department of Health Policy and Management. Prognostic stratification in and cost-effectiveness analysis of cardiovascular disease management.

Jeffrey Levin-Scherz, MD, MBA; Assistant Professor in the Department of Health Policy and Management. Health care affordability; managed care; provider incentives and disease management.

Matthew H. Liang, MD, MPH; Professor in the Department of Health Policy and Management. Epidemiology of rheumatic disease and disability; clinimetrics; health services research; technology assessment.

Tracy A. Lieu, MD, MPH; Professor in the Department of Health Policy and Management. Children's primary care delivery and outcomes; cost-effectiveness analysis.

Eric C. Schneider, MSc, MD; Associate Professor in the Department of Health Policy and Management. Health care quality, including quality measurement, organizational and socioeconomic influences, and quality-improvement strategies.

Jane C. Weeks, MD, SM; Professor in the Department of Health Policy and Management. Outcomes of cancer treatment; effectiveness of resource utilization in medical oncology; medical decision making in oncology.

Joel S. Weissman, PhD; Associate Professor in the Department of Health Policy and Management. Access to care for the uninsured; disparities in care for vulnerable populations; quality and patient safety; drug policy.

Adjunct Faculty

Mark A. Bloomberg, MD, MBA. Tufts University School of Medicine.

Troyen A. Brennan, MA, JD, MPH, MD. Aetna.

Mark J. Campbell, MEd. M. J. Campbell Associates.

Michael H. Cohen, JD, MBA, MFA. Law Offices of Michael H. Cohen.

James B. Conway, MA, MS. Institute for Health Care Improvement.

Deborah Devaux, MHSA. BDC Advisors, LLC.

Maria G. M. (Myriam) Hunink, MD, PhD. Erasmus University Medical Center, Rotterdam, the Netherlands.

David Javitch, MA, PhD. Boston University School of Public Health.

Cleve L. Killingsworth, MPH. Blue Cross Blue Shield of Massachusetts.

Karen M. Kuntz, SM, SD. University of Minnesota School of Public Health.

Karl W. Lauterbach, MD, MPH, MS, SD. Institute of Health Economics and Clinical Epidemiology, Cologne, Germany.

Zita Lazzarini, JD, MPH. University of Connecticut School of Medicine.

Lucian L. Leape, MD. Institute for Healthcare Improvement.

Eugene Litvak, MS, PhD. Boston University School of Public Health.

Linda MacCracken, MBA. Solucient Business Development.

John E. McDonough, MPA, DPH. Health Care for All.

George B. Moseley III, MBA, JD. University Seminar Center.

Benjamin W. Moulton, JD, MPH. American Society of Law, Medicine, and Ethics.

Jeremy J. Nobel, MD, MPH, SM. Nobel and Associates.

Joseph S. Pliskin, SM, PhD. Ben-Gurion University, Israel.

Janet E. Porter, MBBChir, MA, FRCS, FFAEM. Dana-Farber Cancer Institute.

Lisa A. Prosser, MS, MS, PhD. University of Michigan.

Deborah B. Prothrow-Stith, MD. SpencerStuart.

Dorothy E. Puhy, MBA. Dana-Farber Cancer Institute.

Karen M. Quigley, MPH. Health care consultant.

Stephen C. Resch, MPH, PhD. Abt Associates.

Vinod K. Sahney, MSME, PhD. Blue Cross Blue Shield of Massachusetts.

Uwe Siebert, MD, MPH, SM, SD. University for Health Sciences, Medical Informatics and Technology, Austria.

Richard B. Siegrist, Jr., MS, MBA. WebMD Quality Services.

David M. Studdert, LLB, MPH, SD. University of Melbourne, Australia.

Department of

IMMUNOLOGY AND INFECTIOUS DISEASES

THE DEPARTMENT OF IMMUNOLOGY AND INFECTIOUS DISEASES (IID) FOCUSES ON THE BIOLOGICAL, IMMUNOLOGICAL, EPIDEMIOLOGICAL, AND ECOLOGICAL ASPECTS OF VIRAL, BACTERIAL, PROTOZOAN, AND HELMINTHIC DISEASES OF ANIMAL AND HUMANS AND THE VECTORS THAT TRANSMIT SOME OF THESE INFECTIOUS AGENTS.

RESEARCH IN THE DEPARTMENT EMPHASIZES basic pathogenic mechanisms that may lead to better diagnostic tools, the development of vaccines and other interventions for prevention and control of infection and disease, and the identification of new targets for antiviral and antiparasitic drugs. Laboratory-based research within the school may be supplemented by field-based studies of epidemiological and ecological aspects of infectious disease transmission and control. Diseases of developing countries are emphasized.

Members of the department take a multidisciplinary approach that includes immunology, molecular biology, public health entomology, cell biology and ultrastructure, biochemistry, pathology, virology, epidemiology, and ecology. The faculty undertakes research both within the school and around the world.

Infectious diseases currently under study include protozoa (malaria and leishmania), helminths such as schistosomes, viruses (HIVs, leukemia retroviruses, West Nile and eastern equine encephalitis), and bacteria (Lyme disease agents, ehrlichia, tuberculosis). Further immunologic studies focus on genetic regulation of the immune response, the function and regulation of T-cell-derived cytokines, and cytokines involved in the regulation of inflammation.

HARVARD MALARIA INITIATIVE

"Malaria is a fully preventable, controllable disease," says Professor Dyann Wirth, director of the Harvard Malaria Initiative and chair of the HSPH Department of Immunology and Infectious Diseases. About 300 to 500 million people worldwide get malaria each year. If new treatments are not developed, that number could double in the next ten years.

The Harvard Malaria Initiative is "an epicenter of hope" in the battle against the disease, which kills two million each year, mostly young children. Global eradication programs in the past have failed, but Wirth believes that with "the new knowledge we have and a mosaic of tools, it is now more feasible."

The Harvard Malaria Initiative encompasses over a hundred investigators working on more than a dozen projects. There are many opportunities for graduate students to work on these projects in labs here and overseas. Projects include efforts to stop or interfere with the transmission of the disease from mosquitoes through vector biology, genomic studies of the parasite, and other approaches that range from fundamental chemistry through epidemiology and field study design.

One of the primary goals of the initiative is to discover entirely new classes of drugs and vaccines. "One of the biggest challenges is that the malaria parasite has evolved and is resistant to all known antimalarial drugs," Wirth points out. The malaria initiative is collaborating with the Broad Institute of Harvard and MIT and with Genzyme to "take things we've discovered and move them quickly into the drug development pipeline."

Degree Programs in Immunology and Infectious Diseases

As described below, the department offers doctor of science (SD) and doctor of philosophy (PhD) degree programs. No master of science programs are available.

Students in both programs choose among the areas of interest described below:

Immunology The curriculum for this area of interest currently focuses on genetic regulation of the immune response and the function and regulation of T-cell-derived cytokines. Students take courses in cell biology, immunology, and molecular immunology.

Immunology and molecular biology of parasitic and other infections This area of interest introduces students to recent advances in the biology of parasitic and infectious diseases and provides background for conducting research on these diseases. The program emphasizes molecular biology, immunology, cell biology, and the epidemiology of parasites.

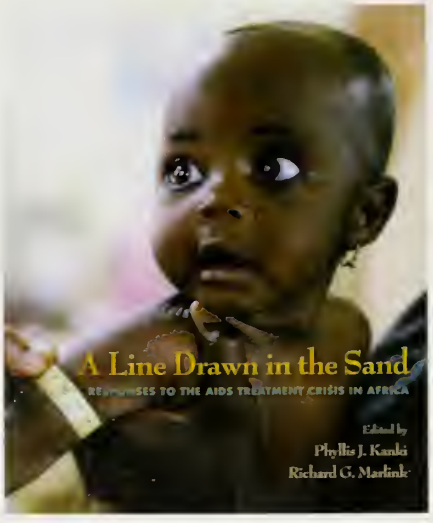
Infectious disease epidemiology and tropical public health This area of interest provides a solid understanding of epidemiology, ecology, and control of infectious diseases in developing countries. It emphasizes control and prevention measures and the biological basis of diseases caused by pathogens that range from viruses to parasites.

Vector biology, ecology, and control This area of interest focuses on the manner in which blood-feeding arthropods interact with their various vertebrate hosts and with the human pathogens that they transmit. This area combines biological experimentation, epidemiological analysis, and population studies. Students become familiar with the various arthropods that are associated with human disease and learn the ways environmental change may result in ill health. Students conduct studies on mechanisms of transmission of vector-borne pathogens, both in the laboratory and in the field, and devise novel intervention strategies.

Virology This area of interest is designed to prepare a future generation of experts for new developments in the pathogenesis and prevention of AIDS and other infectious diseases. At present the program emphasizes the epidemiology, biology, and vaccinology of AIDS as an example of a complex infectious disease. Students take courses in virology, vaccine development, and related fields.

Doctor of Science in Immunology and Infectious Diseases

The SD program is designed for those interested in immunology, molecular biology, virology, and the epidemiology of infectious diseases. The program prepares students for postdoctoral research fellowships; junior faculty positions at academic institutions; and positions in independent scientific research institutions, governmental agencies, and the biotechnology industry.



Applicants to the SD program must have a clinical degree (MD, DVM, DMD, or equivalent). Candidates must have adequate background in modern biology, including microbiology; must identify an area of study and specific project; and must obtain the approval of an IID mentor before applying.

This program aims to develop the basic skills in laboratory techniques and data handling necessary for undertaking original research. Course selection will largely depend on the student's area of work and chosen adviser. Courses may be taken at Harvard Medical School, the Harvard Graduate School of Arts and Sciences, and MIT, as well as at HSPH.

Students are encouraged to participate in the numerous seminar series and informal discussion groups offered on the Harvard Longwood campus. The department emphasizes publication of research results in the standard research literature, and most doctoral students publish several papers before completing the degree. The dissertation is based on intensive laboratory research under the guidance of a faculty

COURSES OF INSTRUCTION

Please note that courses listed are subject to change and some are not offered every year. Complete course descriptions are available at http://www.hsph.harvard.edu/registrar/courses.

Ecology, Epidemiology, and Control of Important Parasitic Diseases of Developing Areas
Tuberculosis: The Host, the Organism, and the Global Threat
Survey of Immunology
Principles of Public Health Entomology
Immunology of Infectious Diseases
Cellular and Molecular Biology of Parasites
Design and Development of a Vaccine
Genetics and Genomics of Infectious Diseases: Tuberculosis, Malaria, HIV
Combating Infectious Diseases in the Developing World
Introduction to Computational Genomics for Infectious Diseases
Clinical Tropical Medicine and Infectious Disease
Independent Study, Tutorials

RELATED OFFERINGS

Interdisciplinary concentration in the epidemiology of infectious disease, see page 58.

adviser in the student's area of interest. Students choose a faculty adviser whose research interests match their own when beginning to research their thesis topic. For information about schoolwide requirements for doctoral degrees, see page 5.

Limited funding is available to qualified SD students who are U.S. citizens or permanent residents. A training grant from the NIH Fogarty Institute also provides some support for international students.

Doctor of Philosophy in Biological Sciences in Public Health (Immunology and Infectious Diseases)

Students wishing to study cellular and molecular biology, immunology, virology, or physiology as it pertains to major problems in public health should apply to the PhD program offered by the Division of Biological Sciences through the Harvard University Graduate School of Arts and Sciences. The PhD program is designed to train scientists in state-of-the-art concepts and methods in immunology, immune system disorders, virology, the biology of parasites, or important infectious diseases. For more information about the PhD program, see page 56.

Contact Information

For more information about the SD program in immunology and infectious diseases or other departmental inquiries, please contact Andrea Sabaroff, administrative coordinator, Department of Immunology and Infectious Diseases, 651 Huntington Avenue, Boston, MA 02115, or visit the department website.
Phone: 617-432-1023
Fax: 617-739-8348
Web: http://www.hsph.harvard.edu/departments/immunology-and-infectious-diseases

For the PhD Program in Biological Sciences in Public Health, online submissions are encouraged, using the Graduate School of Arts and Sciences (GSAS) application form available at the web address below:
Web: http://www.gsas.harvard.edu/hils/admissions_apply.html

DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2009–10.

Department chair: Dyann F. Wirth, PhD; Richard Pearson Strong Professor of Infectious Diseases. Biochemistry; molecular biology; genomics; microbiology; parasitology.

Barry R. Bloom, PhD; Joan L. and Julius H. Jacobson Professor of Public Health, and Harvard University Distinguished Service Professor. Mechanisms of resistance and pathogenesis of diseases, particularly tuberculosis and leprosy; genetic analysis of host resistance; genetically engineered vaccines against tuberculosis.

Barbara Burleigh, PhD; Associate Professor of Immunology and Infectious Diseases. Chagas disease; host-pathogen interactions.

Manoj T. Duraisingh, MSc, PhD; Assistant Professor of Immunology and Infectious Diseases. Molecular basis of the mechanisms underlying the pathogenesis of *Plasmodium falciparum* malaria; devising vaccine and drug strategies for control of the disease.

Myron (Max) Essex, MS, DVM, PhD; Mary Woodward Lasker Professor of Health Sciences. Role of retroviruses as infectious agents in AIDS; mechanisms of immunosuppression by retroviruses; African HIVs.

Sarah M. Fortune, MD; Assistant Professor of Immunology and Infectious Diseases. Molecular mechanisms by which *Mycobacterium tuberculosis* persists and causes disease in the infected host.

Laurie H. Glimcher, MD; Irene Heinz Given Professor of Immunology. Biochemical and genetic approaches to elucidate the molecular pathways that regulate CD_4 T helper-cell development and activation.

Michael J. Grusby, PhD; Professor of Molecular Immunology. Molecular and genetic analysis of the JAK/STAT signaling pathway.

Tiffany Horng, PhD; Assistant Professor of Genetics and Complex Diseases. Chromatin biology and epigenetics; transcriptional regulation of inflammation and immune responses.

Phyllis J. Kanki, DVM, SD; Professor of Immunology and Infectious Diseases. Pathobiology and molecular epidemiology of HIVs; characterization of immune responses and correlation to disease pathogenicity; impact of genetic variation.

Tun-Hou Lee, SM, SD; Professor of Virology. Human and nonhuman primate retroviruses; AIDS vaccine research and development.

Marc Lipsitch, DPhil; Professor of Epidemiology. Population biology of infectious agents; epidemiologic methods for emerging infections; antimicrobial resistance; *Streptococcus pneumaniae*; immunoepidemiology.

Richard G. Marlink, MD; Bruce A. Beal, Robert L. Beal, and Alexander S. Beal Professor of the Practice of Public Health. Clinical, epidemiological, and experimental approaches to improve HIV/AIDS prevention, care, and treatment in the developing world; role of host and virus in determining HIV outcomes.

Matthias Marti, MSc, PhD; Assistant Professor of Immunology and Infectious Diseases. Systematic analysis of virulence domains in *Plasmodium falciparum;* comparative biology of malaria parasites.

Eric J. Rubin, MD, PhD; Professor of Immunology and Infectious Diseases. Genetics of tuberculosis.

Secondary Appointments

(primary appointments at Harvard Medical School)

Samuel M. Behar, PhD, MD; Associate Professor in the Department of Immunology and Infectious Diseases. Characterization of immunological pathways required for host defense against *Mycabocterium tuberculasis* infection; mechanisms of vaccine-induced protection against tuberculosis.

Marcia B. Goldberg, MD; Associate Professor in the Department of Immunology and Infectious Diseases. Characterization of the molecular mechanisms underlying the interactions of bacterial pathogens with host cells; mechanisms of bacterial cell organization relevant to virulence.

Anne E. Goldfeld, MD; Associate Professor in the Department of Immunology and Infectious Diseases. Studies on immunopathogenesis of tuberculosis and AIDS and their integration with novel community-based approaches to treatment; TNF gene regulation.

Donald A. Goldmann, MD; Professor in the Department of Immunology and Infectious Diseases. Epidemiology of nosocomial infections; epidemiologic approaches to medical outcomes assessment and hospital quality improvement.

Daniel L. Hartl, PhD: Professor in the Department of Immunology and Infectious Diseases. Drug resistance, genetic variation, and molecular evolution of the malaria parasite; molecular evolution of bacterial antibiotic resistance.

Martin S. Hirsch, MD; Professor in the Department of Immunology and Infectious Diseases. Pathogenesis and therapy of human retrovirus and herpes virus infections.

Shahin Lockman, MD, SM; Assistant Professor in the Department of Immunology and Infectious Diseases. Prevention of mother-to-child HIV-1 transmission; antiretroviral therapeutics for HIV/AIDS in resource-limited settings.

Kenneth McIntosh, MD; Professor in the Department of Immunology and Infectious Diseases. Pathogenesis, prevention, and treatment of pediatric respiratory viral diseases; coronaviruses; new methods in viral diagnosis; epidemiology and pathogenesis of respiratory infections.

Edward A. Nardell, MD; Associate Professor in the Departments of Environmental Health and Immunology and Infectious Diseases. Airborne transmission and infection control of *Mycabacterium tuberculosis;* air disinfection with ultraviolet irradiation.

Edward T. Ryan, MD, DTM&H; Associate Professor in the Department of Immunology and Infectious Diseases. Enteric infections and the development of vaccines protective against such infections.

Roger L. Shapiro, MD, MPH; Assistant Professor in the Department of Immunology and Infectious Diseases. Prevention of mother-to-child HIV transmission; HIV treatment and prevention.

Joseph G. Sodroski, MD; Professor in the Department of Immunology and Infectious Diseases. Role of the HIV-1 envelope glycoproteins in virus entry; topological and structural analysis of the HIV-1 envelope glycoproteins; generation of HIV-1 neutralizing antibodies.

Bruce D. Walker, MD; Professor of Medicine in the Department of Immunology and Infectious Diseases. Characterization of the correlates of immune protection in HIV infection; HIV evolution under immune selection pressure; HIV vaccine development.

Peter F. Weller, MD; Professor in the Department of Immunology and Infectious Diseases. Investigations pertinent to the roles of eosinophils in allergic and antiparasite immune responses and to the cellular biology of leukocytes underlying their functions in infectious and immune inflammatory responses.

Adjunct Faculty

Claudio A. Hetz, PhD. University of Chile.

Fotis C. Kafatos, MA, PhD. Imperial College, London, United Kingdom.

Danny A. Milner, Jr., MD. Brigham and Women's Hospital.

Thomas P. C. Monath, MD. Kleiner Perkins Caufield & Byers.

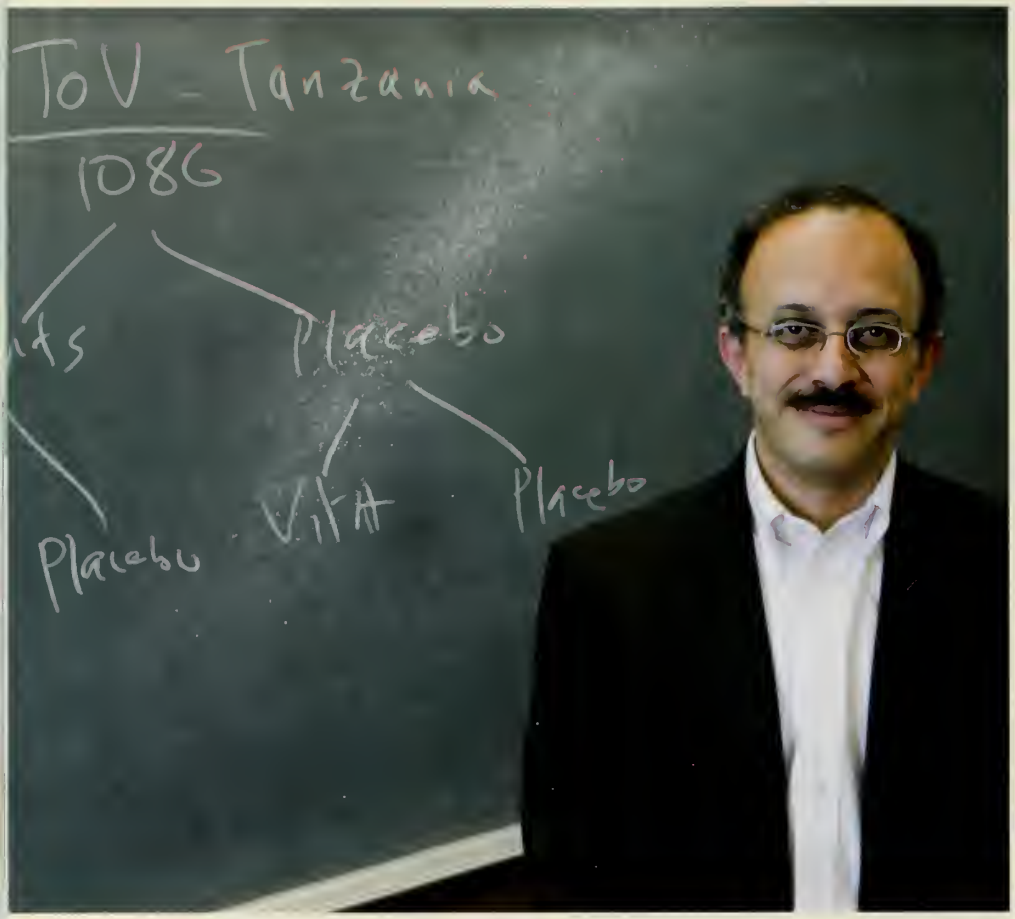
Robert L. Murphy, MD. Feinberg School of Medicine, Northwestern University.

Marc A. T. Muskavitch, PhD. Boston College.

Stephen J. O'Brien, PhD. National Cancer Institute.

Abhay R. Satoskar, MD, PhD. Ohio State University.

Department of NUTRITION



THE MISSION OF THE DEPARTMENT OF NUTRITION IS TO IMPROVE HUMAN HEALTH THROUGH ENHANCED NUTRITION. THE DEPARTMENT STRIVES TO ACCOMPLISH THIS GOAL THROUGH RESEARCH AIMED AT IMPROVED UNDERSTANDING OF HOW DIET INFLUENCES HEALTH, THE DISSEMINATION OF NEW KNOWLEDGE ABOUT NUTRITION TO HEALTH PROFESSIONALS AND THE PUBLIC, THE DEVELOPMENT OF NUTRITIONAL STRATEGIES, AND THE EDUCATION OF RESEARCHERS AND PRACTITIONERS.

GLOBAL COLLABORATIONS ON NUTRITION RESEARCH

For more than fifteen years, Dr. Wafaie Fawzi, HSPH professor of nutrition and epidemiology, has led a collaboration in Tanzania that has bridged issues of nutrition with maternal and child health and infectious diseases. The team also has programs ongoing in India, Uganda, and Brazil.

"Malnutrition is a direct or indirect cause of 50 percent of ten million child deaths that occur annually worldwide," explains Fawzi. "Nutritional interventions provide relatively low-cost approaches to improving survival and quality of life among individuals in developing countries."

Through numerous large randomized clinical and epidemiological research studies, Fawzi and his team have found, for example, that prenatal vitamins reduce fetal loss, low birth weight, and severe prematurity. Mothers with a better nutritional status during pregnancy and lactation have children who are less likely to die in the first two years of life and less likely to have diarrheal and other infectious diseases. Multivitamins also slowed the progression of HIV disease, prolonging the time before antiretroviral therapy is needed. The team also trains future leaders and policymakers to translate findings from research into public health programs.

Fawzi is principal investigator of the Nutrition and Global Health Program, part of the Harvard Initiative for Global Health. With collaborators in India, Tanzania, and Brazil and across Harvard, the program aims to develop new curricula and increase the number of U.S. and international students engaged in nutrition and global health research. This research addresses both the unfinished agenda of undernutrition and the growing threat of obesity and noncommunicable diseases.

THE DEPARTMENT OF NUTRITION PROVIDES training and research opportunities in basic science relating to nutrition and in epidemiologic aspects of nutrition as they affect public health. Nutrition policy and the evaluation of nutritional interventions are longstanding interests of the department, particularly as they concern the populations of Latin America, Africa, Asia, and the United States. Department research ranges from molecular biology to human studies of cancer and heart disease, including the conduct of population-based intervention trials. Students learn and use the latest techniques in biochemistry, physiology, biostatistics, epidemiology, and related fields. Departmental research, whether basic or applied, is relevant to human health.

Current research covers a wide range of topics, including large prospective studies of dietary factors in relation to heart disease, cancer, diabetes, and ophthalmologic disease; development of methods to assess nutritional status by analysis of body tissue; the interaction of nutritional factors with genetic determinants of disease; the interaction of nutritional factors and infectious agents; nutritional influence on blood pressure; effects of nutrition programs on the mental and physical consequences of mal-

nutrition; nutritional determinants of blood lipid factors; lipoprotein metabolism; molecular mechanisms of diabetes and obesity; regulation of the intra- and intercellular delivery of macromolecular nutrients; and the molecular mechanism leading to atherosclerosis and thrombosis.

Degree Programs in Nutrition

As described below, the department offers two doctoral programs. The first is a program leading to the doctor of science (SD) or doctor of public health (DPH) degree in nutrition, with concentrations in either nutritional epidemiology or public health nutrition. The second is a doctor of philosophy (PhD) program in biological sciences in public health (nutritional biochemistry/cardiovascular biology). Applicants to the PhD program who hold a clinical degree in medicine, veterinary medicine, or dentistry may prefer to follow a different curriculum leading to the SD degree in nutritional biochemistry. This option may be available by special arrangement with the department. No master's degree programs are available.

Doctor of Science in Nutrition/Doctor of Public Health

The concentration in nutritional epidemiology or in public health nutrition, leading to the SD or DPH degree, provides rigorous training in epidemiology and biostatistics as well as the biological aspects of nutrition. The overall objective of the nutritional epidemiology concentration is to enable students to investigate relationships between diet and disease. Students in public health nutrition combine behavioral sciences with biologic and quantitative approaches to design and evaluate nutrition programs, policies, and the dissemination of nutrition research.

Graduates are prepared for careers as research scientists in academic institutions, private-sector organizations, and public health agencies in state, national, and international settings. Recent graduates are now working at universities, research foundations, pharmaceutical companies, the National Cancer Institute, and the American Cancer Society.

Applicants must have a strong background in biology and mathematics. An MD or other professional health-related degree is desirable but not required. Applicants for the DPH program must have or be in progress toward an MPH degree and must also hold an advanced degree in a basic public health discipline.

For the nutritional epidemiology concentration, one of the two required minors must be in epidemiology; for the public health nutrition concentration, students complete one minor in quantitative methods (biostatistics or epidemiology) and one minor in a behavioral science relevant to the development of public health programs and policies (for example, society, human development, and health). For more information on schoolwide requirements for doctoral degrees, see page 5.

Admission to a joint program with the Department of Epidemiology requires the approval of both departments, and applicants should contact the Department of Nutrition before making formal application. All students in a joint program with Epidemiology must satisfy the major requirements of both departments, complete a minor acceptable to both, and write a dissertation on a topic concerning both nutrition and epidemiology.

For the SD and DPH programs, funding may be available through the NIH-supported Training Program in Nutritional Science for students with previous doctoral degrees.

Doctor of Philosophy in Biological Sciences in Public Health (Nutritional Biochemistry/Cardiovascular Biology)

Students wishing to study cellular and molecular biology or physiology as it pertains to major problems in public health

COURSES OF INSTRUCTION

Please note that courses listed are subject to change and some are not offered every year. Complete course descriptions are available at http://www.hsph.harvard.edu/registrar/courses.

Scientific Writing in Nutrition and Epidemiology
Nutritional Epidemiology I and II
Programs and Principles of Public Health Nutrition
Molecular Basis of Nutritional and Metabolic Diseases
Advanced Topics in Nutrition and Cancer
Principles of Nutrition
Science of Human Nutrition
Nutrition Seminars I and II
Advanced Topics in Nutrition II
Seminars in Food Science and Technology
Nutritional Problems of Less-Developed Countries
Research Techniques in Nutritional Biochemistry
Seminar in Nutrition and Food Policy
Nutrition/Health Promotion in the Mass Media
Nutrition: Developing the Applied Research Practicum in Public Health
Applied Research Practicum in Public Health Nutrition
Independent Study, Tutorials

RELATED OFFERINGS

Interdisciplinary concentration in maternal and child health/children, youth, and families, see page 57.
Interdisciplinary concentration in obesity epidemiology and prevention, see page 57.
MPH concentration in family and community health, see page 53.
Nutritional epidemiology area of interest, Department of Epidemiology, see page 20.

should apply to the PhD program offered by the Division of Biological Sciences through the Harvard University Graduate School of Arts and Sciences. The PhD program in nutritional biochemistry offers rigorous training in biochemistry, cell biology, and metabolism, allowing students to work toward solving nutritional and metabolic problems in the laboratory. Students in cardiovascular biology learn to use cutting-edge technologies from molecular biology, biochemistry, and genetics to critically dissect the mechanisms underlying cardiovascular diseases such as heart attacks, strokes, heart failure, atherosclerosis, and congenital heart disease. For more information about the PhD program, see page 56.

Contact Information

For more information about research and training in nutrition, please contact Colleen Bertrand, academic services coordinator, Department of Nutrition, 655 Huntington Avenue, Boston, MA 02115, or visit the department website.
Phone: 617-432-1851
Fax: 617-432-2435
Email: cbertran@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/Academics/nutr/department

For the PhD Program in Biological Sciences in Public Health, online submissions are encouraged, using the Graduate School of Arts and Sciences (GSAS) application form available at the web address below:
Web: http://www.gsas.harvard.edu/hils/admissions_apply.html

DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2009–10.

Department chair: Walter C. Willett, MD, MPH, DPH; Fredrick John Stare Professor of Epidemiology and Nutrition. Nutrition; physical activity; endogenous hormones and risks of noncommunicable disease; dietary assessment methods.

Alberto Ascherio, MD, MPH, DPH; Professor of Epidemiology and Nutrition. Nutritional epidemiology; epidemiology of neurological diseases.

Hannia N. Campos, MS, PhD; Senior Lecturer on Nutrition. Essential fatty acids and chronic disease.

Wafaie W. Fawzi, MBBS, MPH, SM, DPH; Professor of Nutrition and Epidemiology. Etiologies of infectious diseases and perinatal conditions with emphasis on dietary and nutritional causes; dietary factors in disease in pregnancy and childhood.

Edward L. Giovannucci, MD, MPH, SD; Professor of Nutrition and Epidemiology. Etiologies of cancer with emphasis on dietary causes, particularly for prostate and colorectal cancers; methodologies to measure dietary factors in epidemiologic studies.

Gökhan S. Hotamisligil, MD, PhD; James Stevens Simmons Professor of Genetics and Metabolism. Molecular basis of metabolic diseases; studies on regulatory pathways; signal transduction in mammalian cells; biology of fatty-acid binding proteins.

Frank B. Hu, MD, MPH, PhD; Professor of Nutrition and Epidemiology. Nutritional and genetic epidemiology of obesity, diabetes, and cardiovascular disease.

David J. Hunter, MBBS, MPH, SD; Vincent L. Gregory Professor of Cancer Prevention. Genetic epidemiology; cancer epidemiology; international health.

Chih-Hao Lee, PhD; Assistant Professor of Genetics and Complex Diseases. Energy metabolism regulated by nuclear receptors in immunity and metabolism.

Frank M. Sacks, MD; Professor of Cardiovascular Disease Prevention. Nutrition and risk factors for cardiovascular disease; clinical trials on macro- and micronutrients; human lipoprotein pathophysiology; effects of dietary fat and carbohydrates.

Stephanie A. Smith-Warner, MS, PhD; Associate Professor of Nutritional Epidemiology. Examination of dietary factors in relation to cancer risk.

Meir J. Stampfer, MD, MPH, DPH; Professor of Nutrition and Epidemiology. Influence of diet and lifestyle on health, particularly prostate cancer, other cancers, heart disease, and cognitive decline.

Marianne Wessling-Resnick, MS, PhD; Professor of Nutritional Biochemistry. Genetic disorders of iron metabolism at the molecular level and their implications in complex disease.

Secondary Appointments

(primary appointments at Harvard Medical School)

Eunyoung Cho, SD; Assistant Professor in the Department of Nutrition. Epidemiologic evaluation of diet and breast/colon/renal cell cancer and chronic eye diseases; choline and one-carbon metabolism-related research.

Christopher P. Duggan, MD, MPH; Associate Professor in the Department of Nutrition. Oral rehydration solutions for acute diarrhea; nutritional requirements of catabolic patients; micronutrient needs in infectious and critical illness.

Matthew W. Gillman, MD, SM; Professor in the Department of Nutrition. Relationship of diet to chronic conditions and diseases; early origins and early-life prevention of adult chronic diseases; disease prevention in defined populations.

Clifford W. Lo, MD, MPH, ScD; Assistant Professor in the Department of Nutrition. Vitamin D and calcium nutrition; total parenteral nutrition.

David S. Ludwig, MD, PhD; Associate Professor in the Department of Nutrition. Endocrinology; pediatric obesity.

Eric B. Rimm, SD; Associate Professor in the Departments of Epidemiology and Nutrition. Nutrition; cardiovascular disease; genetics; biomarkers; obesity; chronic disease; epidemiology; cohort studies.

Rob M. Van Dam, MSc, PhD; Assistant Professor in the Departments of Nutrition and Epidemiology. Determinants of the development of obesity and type-2 diabetes with a particular interest in the role of diet.

W. Allan Walker, MPH, MD, DPH; Professor in the Department of Nutrition. Nutrition and developmental gastroenterology; nutrition and mucosal immunology; gastrointestinal immunology; protective functions of breast milk.

Adjunct Faculty

Guy Crosby, PhD. Framingham State College.

Teresa T. Fung, MS, SD. Simmons College School of Health Studies.

Sjúdur F. Olsen, MD, MS, DMSc, PhD. University of Aarhus, Denmark.

Karen E. Peterson, RD, SD. University of Michigan.

Eduardo Villamor, MD, MPH, DPH. University of Michigan.

Department of

SOCIETY, HUMAN DEVELOPMENT, AND HEALTH

J. ROBIN MOON

Doctoral student, Department of Society, Human Development, and Health

J. Robin Moon once earned more than she had time to spend as an international management consultant for Price Waterhouse. Her struggles to figure out what she really wanted out of life have landed her in a department at HSPH known for its progressive approach to social determinants of health research. "I've found my purpose in life," comments Robin. She is interested in how the interplay of factors—such as socioeconomic inequality, neighborhood disparities, and social exclusion—affect the health of vulnerable people and in turn their upward mobility.

Robin has experienced what it is to be an immigrant in this country, moving here with her family from South Korea. She learned about poverty through travels to Russia, Central America, and Sub-Saharan Africa; about health disparities as a director of strategic planning for World Vision, an international humanitarian organization; and about philanthropy when she founded and directed the Korean American Community Foundation.

Since 2005 Robin has led an international research initiative for a New Orleans NGO on public markets and community health in post-Katrina New Orleans, the Brazilian Amazon region, and Nairobi, Kenya, areas undergoing rapid transition. She is developing tools and programs that unite research and practice to measure the economic, social, and nutritional impact of markets. From HSPH Robin is seeking the academic foundation to enhance efforts to bring research and practice together. "I want to be the connector," she says, "so money is spent more wisely and more people benefit."

THE MISSION OF THE DEPARTMENT OF SOCIETY, HUMAN DEVELOPMENT, AND HEALTH (SHDH) IS TO IMPROVE HEALTH THROUGHOUT THE LIFE-SPAN, INCLUDING A SPECIAL EMPHASIS ON CHILDREN AND ADOLESCENTS.

THIS MISSION IS ACHIEVED THROUGH research to identify the social and behavioral determinants of health, development and evaluation of interventions and policies leading to the improvement of population health, and the preparation of professionals and researchers who will fill leadership positions in advocacy and public service.

The department's educational mission is to train both scholars and practitioners: scholars whose research will illuminate basic social determinants of health and who will identify and test innovative social policy and service interventions; practitioners who are skilled in designing, implementing, and evaluating health-enhancing interventions in action settings.

The department highlights three areas of interest:

Human development The department's emphasis on human development across the life course results from faculty research and interest in three domains: the physical, mental, and behavioral health and well-being of children and adolescents; basic developmental processes (including physical growth, nutrition, and psychological development); and growing attention to the impact of early-life conditions on long-term health and functioning. Course work in this area of interest includes study of physical growth and development, principles of psychological and social development, and longitudinal research methods. Research conducted by faculty members involves longitudinal studies of both at-risk and community samples, emphasizing cumulative risk and

protective influences across the lifespan and implications for prevention, early intervention, and treatment strategies.

Planned social change This area of interest focuses on the application of theory in the design of intervention programs, as well as on research and evaluation methodology. The area includes work on interventions using randomized clinical trial designs and quasi-experimental approaches. Attention is given to the following design steps: problem diagnosis, assessment, formative research, program design, and evaluation. The social settings for interventions may be communities, workplaces, schools and colleges, and health care facilities. Populations of interest include those who are underserved, marginalized, and in special need. Intervention strategies include educational interventions, community organizing and development, social marketing, communication, adult-learning approaches, and advocacy.

Social determinants of health This area of interest emphasizes the analysis of the major social conditions that affect the health of populations. Research stresses socioeconomic position, social and economic inequality, discrimination, social networks and support, social capital, work conditions, and psychological states. Seminars, tutorials, and courses enable students to explore a range of the health consequences of various social factors by studying varied subgroups, at different times and places and under diverse and changing conditions.

Students examine mechanisms and processes through which social factors exert their impact, and also investigate mechanisms that mediate or moderate relationships between social factors and health outcomes.

Degree Programs in Society, Human Development, and Health

As described below, the department offers both 80-credit and 42.5-credit master of science (SM) programs, a dual-degree master's program for nurses and social workers, and a doctoral program leading to the doctor of science (SD) or doctor of public health (DPH) degree. Students in all degree programs may follow the interdisciplinary concentration in maternal and child health/children, youth, and families and/or the interdisciplinary concentration in women, gender, and health. Within the doctoral and 80-credit master's programs only, students may follow a concentration in health communication. For information about schoolwide requirements for master's and doctoral degrees, see page 5.

Master of Science in Society, Human Development, and Health (80-credit and 42.5-credit programs)

The 80-credit, professional SM program prepares students for a variety of positions in community, public, and private settings. These roles include the design, management, and evaluation of programs, particularly health promotion and disease prevention programs, health communication programs, and those providing services to women, youth, and children. Other roles include work in research, public policy, and advocacy. The health communication concentration is especially intended for those who seek positions as independent researchers and scholars; public health communicators in the private sector, state and federal agencies, international agencies, and nonprofit organizations; and public health leaders who require communication skills.

Recent graduates have taken such positions as the evaluator on a violence prevention program for adolescents, associate director of public health and research at George-

town University, assistant medical director of the Rhode Island Health Department, and intern in the Presidential Management Program, Office of the Budget for Health and Human Services; others have gone on to earn doctoral degrees.

Applications are encouraged from students who have a strong social sciences and/or natural sciences background, public health experience, and defined public health goals. Solid mathematics and writing skills and successful experience with course work requiring critical reading and writing, drawing of inferences, and rigorous analysis are crucial. Previous graduate work is not required.

Students must earn at least 20 credits in departmental courses. They are not required to declare an area of interest within the department but are encouraged to take course work in all three. In addition to fulfilling HSPH, SHDH, and practice core requirements, students are expected to delineate professional goals and to develop an area of expertise. They often focus on a subject area (such as AIDS; addiction; cardiovascular or cancer risk reduction; the health of children, adolescents, or women; and mental health) and/or a skill area (such as program design and evaluation, communication, policy analysis, or marketing). Students must complete a practicum, which consists of skill development in a practice setting, two seminars, and a final paper.

In the health communication concentration, students must take a core course on theories of health communication, two courses in health communication in applied settings, and one on advanced topics. All students should consult the department's Curriculum and Advising Guide for a listing of required courses.

The 42.5-credit SM program is intended to prepare students for research careers in public and private agencies. Applicants eligible for the 42.5-credit program are established practitioners or investigators holding prior master's or doctoral degrees in the social/behavioral sciences, health care, or a public health field. Students in this program must fulfill the schoolwide requirements and earn 15 credits in departmental courses. They should work closely with their advisers to develop a study plan to meet their particular academic and career goals.

RELATED OFFERINGS

Interdisciplinary concentration in maternal and child health/children, youth, and families, see page 57.
Interdisciplinary concentration in obesity epidemiology and prevention, see page 57.
Interdisciplinary concentration in women, gender, and health, see page 58.
MPH concentration in family and community health, see page 53.

Master of Science in Society, Human Development, and Health (HSPH 42.5-credit program) and Master of Social Work or Master of Science in Parent-Child Nursing or in Women's Health (Simmons College)

These professional, dual-degree programs, which require that 42.5 credits be earned at HSPH, are designed to prepare nurse practitioners and social workers for leadership roles in public and private institutions serving children and their families. Recent graduates have taken such positions as director of clinical services for the Family Planning Association of Maine and staff director for the World Health Organization Maternal Health and Safe Motherhood Program.

Applicants should have a relevant bachelor's degree and the equivalent of at least three years of relevant experience. International applicants with equivalent degrees and experience are eligible to apply. International nurses must have equivalent licensure. Applicants must also meet the general admission requirements of both HSPH and Simmons College.

Students enroll in half-time study at both Simmons College and HSPH for two academic years, in addition to studying at Simmons for one summer session. See the department's Curriculum and Advising Guide for degree requirements. Continued matriculation is dependent on maintaining satisfactory academic progress in both programs.

Doctor of Science in Society, Human Development, and Health/Doctor of Public Health

The doctoral program provides a common core education addressing issues of society, human development, and health at the same time as developing expertise in one of the three previously described areas of

interest (human development, planned social change, and the social determinants of health). Students must select an academic focus in one of these areas. All students should consult the department's Curriculum and Advising Guide for a listing of required courses.

Current and recent doctoral students in the department have undertaken dissertation research projects on the following topics: socioeconomic position, allergic disease, and cancer risk; cross-national comparisons of perinatal care technologies on neonatal survival; poverty, policy, neighborhoods, and health; effectiveness of public policies for children with disabilities; social influences on health behaviors of college students with same-sex experience; depressive symptoms in postpartum women; gender inequality and health; measurement and social and physical contexts of physical activity; and cost-effectiveness of lead-poisoning prevention programs.

Recent graduates have taken such positions as Epidemic Intelligence Service officer at the Centers for Disease Control and Prevention (CDC) in Atlanta, postdoctoral fellow at

COURSES OF INSTRUCTION

Please note that the courses listed are subject to change and some are not offered every year. Complete course descriptions are available at http://www.hsph.harvard.edu/registrar/courses.

Physical Growth and Develapment
Nutritian in Child Grawth and Development
Social Epidemiolagy
Practice of Family and Cammunity Heolth II
Mentol Heolth of Children and Adolescents
Medio and Health Communication: Practical Skills
Saciety and Health
Life Course Epidemiolagy
Cammunicatian in Health Core Settings
Race, Ethnicity, and Heolth: Perspectives fram Social and Behaviaral Sciences
Adolescent Heolth
Wamen, Health, and Development: Recanciling Science and Policy
Health Pramation Thraugh Moss Media
Developmental Disabilities I: Evaluotion, Assessment, and Systems
Develaping Radia Communications
Developmental Disabilities II: Volue, Policy, ond Change
Histary, Politics, ond Public Health: Thearies af Disease Distributian
Childbirth Health Policy and Epidemiology
High-Risk Behaviar: Epidemiology and Preventian Strotegies
Society ond Its Effects an Child Health
Psychasocial Thearies of Health and Health Behovior
Sacial Services for Children, Adalescents, ond Families
Services for Children with Disobilities
Future Health Communication: New Media and Emerging Technalogies
Community Intervention Reseorch Methads
SHDH Department Praseminar
Public Health Genetics: Contemparory Issues ond Chollenges
Qualitative Research Methads for Public Health
Practice of Preventing Intimate Portner Vialence
Sacial Policy and Legal Dilemmas: Child Custady and Visitatian
Applied Methods for Secandary Data
Sacial and Behavioral Research Methads I
Issues in MCH Programs and Policies
Approaches to Internotional Tabacco Control and Public Health Practice
Social Disparities, Stress, and Health
Aging, Life Course Sacial Conditions, and Public Health
Research on Sacial and Behavioral Health: A Practical Guide
SHDH Moster's Seminar
Multilevel Statistical Methods: Concept and Applicotion
Program Planning: Design ond Evaluatian
Doctorol Seminar an Society, Human Development, and Health
Innovotive Strotegies in Health Educotian
Health Literocy
Methads for Research an Social and Behavioral Dimensions of Public Health
Personolity and Cognitive Development: Applicatian to Public Health
Policy Analysis Methads for Public Health
MCH Seminar
Place, Migration, ond Health
Practicum Praject Planning and Evoluation
Health and Sociol Policy Doctarol Seminar
Leadership in Minarity Health Policy
Sexuality and Public Health
Issues in Minority Health Policy
Science of Learning, Behaviar, and Health
Clinical Effectiveness Seminar
Infont Assessment in the Context of Perinatal Expasure
Independent Study, Tutorials

the National Development and Research Institute in New York, research scientist at Harvard University, project officers in philanthropic foundations, and assistant professors at schools of public health and medical schools. Graduates are pursuing careers in academia, government, and nonprofit organizations as leading researchers, teachers, policymakers, and program developers, such as chair of a department of obstetrics in Taiwan and chief of the lead-poisoning branch at the CDC.

Most students enter the doctoral program with a strong foundation in the social, behavioral, clinical, public health, or natural sciences and with an earned master's degree in a social science (such as sociology, psychology, economics, political science, public policy, and anthropology); clinical health (such as nursing and social work); public health (such as epidemiology and health education); or natural sciences (such as biology, physiology, and neurosciences).

For the SD the department may accept a small number of students without a master's degree directly into the program. Candidates for the DPH degree must have or be in progress toward an MPH degree and must also hold an advanced degree in a basic public health discipline.

Limited funding is awarded on a competitive basis to qualified applicants in both master's and doctoral programs. Two training grants from the Maternal and Child Health Bureau support some students in the interdisciplinary concentration in maternal and child health/children, youth, and families. A fellowship for doctoral students is available in the area of cancer prevention, and some doctoral fellowships may also be available for underrepresented minorities. A limited number of university-wide presidential fellowships are awarded on a competitive basis to underrepresented minorities and to students from developing countries who are planning on public service or academic careers. Students receive funding in other areas through research assistantships and their own grant applications.

Contact Information

For more information about research and training in Society, Human Development, and Health, please contact Elizabeth Solomon, assistant director for academic affairs and fellowship programs, Department of Society, Human Development, and Health, 677 Huntington Avenue, Boston, MA 02115, or visit the department website.
Phone: 617-432-3761
Fax: 617-432-3755
Email: esolomon@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/shdh

DEPARTMENT FACULTY

Please note that some faculty members may be on leave during academic year 2009–10.

Department chair: Ichiro Kawachi, MD, PhD; Professor of Social Epidemiology. Social inequalities in health, especially related to income distribution; stress and cardiovascular disease; quality of life and healthy aging; tobacco control.

Dolores Acevedo-Garcia, MPA, PhD; Associate Professor of Society, Human Development, and Health. Effect of social determinants on racial and ethnic health disparities; role of nonhealth policies on reducing health disparities; residential segregation; immigration; children with special needs.

Lisa F. Berkman, MS, PhD; Thomas D. Cabot Professor of Public Policy and of Epidemiology. Social epidemiology; population health; epidemiology of aging.

Gregory N. Connolly, DMD, MPH; Professor of the Practice of Public Health. Impact of policies restricting smoking; structure and marketing practices of the tobacco industry; analysis of internal tobacco industry documents; tobacco product design and use.

Felton J. Earls, MD; Professor of Human Behavior and Development. Community-based participatory research; child and adolescent mental health; prevention of HIV/AIDS; prevention of violence and related behaviors.

Karen M. Emmons, MA, PhD; Professor of Society, Human Development, and Health. Cancer disparities; community-based cancer prevention interventions; health communication.

Stephen E. Gilman, SM, SD; Assistant Professor of Society, Human Development, and Health. Social epidemiology of psychiatric disorders; health disparities; and the life course.

Maria Glymour, SM, SD; Assistant Professor of Society, Human Development, and Health. Social determinants of health in aging; cognitive change in the elderly; socioeconomic and geographic determinants of stroke incidence and outcomes; causal inference in social epidemiology.

Steven L. Gortmaker, MS, PhD; Professor of the Practice of Health Sociology. Identifying modifiable risks for morbidity and mortality in the young, particularly those living in poverty and minority populations, and initiating and evaluating interventions to improve these outcomes.

Karestan C. Koenen, MA, PhD; Associate Professor of Society, Human Development, and Health. Trauma; posttraumatic stress disorder; developmental psychopathology; gene-environment interaction; psychiatric epidemiology.

Nancy Krieger, MS, PhD; Professor of Society, Human Development, and Health. Conceptual frameworks to understand, analyze, and improve population health and reduce health inequities; ecosocial theory of disease distribution; societal determinants of population health; methodological research on improving monitoring of health inequities.

Laura D. Kubzansky, MSc, MPH, PhD; Associate Professor of Society, Human Development, and Health. Psychosocial determinants of health over the life course; social inequality and health; resilience and health; biology of resilience.

Marie C. McCormick, MD, ScD; Sumner and Esther Feldberg Professor of Maternal and Child Health. Epidemiology of infant mortality and low birth weight; measurement of and factors associated with child health status, especially among premature infants; evaluation of MCH programs.

Beth E. Molnar, SM, SD; Assistant Professor of Society, Human Development, and Health. Community-level prevention of child maltreatment; family and community violence and sequelae; social and psychiatric epidemiology; prevention of adolescent risk behaviors.

Rima E. Rudd, MS, ScD; Senior Lecturer on Society, Human Development, and Health. Health literacy; pedagogy related to public health education; participatory research and program design; community-based public health program design and evaluation.

Jack P. Shonkoff, MD; Julius B. Richmond FAMRI Professor of Child Health and Development. Early-childhood policy; childhood roots of disparities in health and learning; development and translation of the science of health, learning, and behavior.

Jay G. Silverman, MS, PhD; Associate Professor of Society, Human Development, and Health. Etiology, epidemiology, and prevention of adolescent and adult intimate-partner violence; sexual and reproductive health in the context of adolescent and adult intimate-partner violence; health effects of exposure to intimate-partner violence among children.

Glorian Sorensen, MPH, PhD; Professor of Society, Human Development, and Health. Cancer prevention and control; worksite and community intervention research; tobacco control; nutrition education.

S. V. Subramanian, MA, MPhil, PhD; Associate Professor of Society, Human Development, and Health. Understanding the role of geographic, spatial, and institutional contexts (e.g., neighborhoods, schools, workplaces) in influencing population health.

Kasisomayajula Viswanath, MA, PhD; Associate Professor of Society, Human Development, and Health. Health communication; health disparities; risk communication; e-health; cancer prevention and control.

David R. Williams, MPH, MA, PhD; Florence Sprague Norman and Laura Smart Norman Professor of Public Health, and Professor of African and African American Studies in the Faculty of Arts and Sciences. Race and SES differences in health; racism and health; religion/spirituality and health; survey research methods.

Secondary Appointments

(primary appointments at Harvard Medical School)

S. Bryn Austin, SD; Assistant Professor in the Department of Society, Human Development, and Health. Environmental influences on nutrition, physical activity, and eating disorders in adolescents; sexual orientation disparities in health.

Allen C. Crocker, MD; Associate Professor in the Department of Society, Human Development, and Health. Chronic illness and developmental disabilities in children; mechanisms of disability.

Barbara Gottlieb, MD, MPH; Associate Professor in the Department of Society, Human Development, and Health. Women's health; unintended pregnancy; depression; minority and community health; adolescent and school health.

Jennifer S. Haas, MD, SM; Associate Professor in the Department of Society, Human Development, and Health. Disparities in health and health status; the role of neighborhood characteristics on health behaviors and outcomes; prescription drug policy.

Charles J. Homer, MD, MPH; Associate Professor in the Department of Society, Human Development, and Health. Application of epidemiologic methods to assess the effectiveness of health care services.

Ellice S. Lieberman, MD, MPH, DPH; Professor in the Department of Society, Human Development, and Health. Perinatal epidemiology; risk factors for adverse pregnancy outcomes; assessment of new technologies and care practices in obstetrics.

Charles A. Nelson, PhD; Professor in the Department of Society, Human Development, and Health. Developmental cognitive neuroscience; risk factors for atypical brain-behavioral development; effects of early experience.

Judith S. Palfrey, MD; Professor in the Department of Society, Human Development, and Health. Development of preschool children; interface of health and educational services for children.

Joan Y. Reede, MD, MPH, SM, Associate Professor in the Department of Society, Human Development, and Health. Biomedical manpower and academic/research career development; health services to and impact of health policy on minority and other populations.

Michael O. Rich, MD, MPH; Assistant Professor in the Department of Society, Human Development, and Health. Children's health and communications media; the illness experience from the patient's perspective.

Ronald C. Samuels, MD, MPH; Assistant Professor in the Department of Society, Human Development, and Health. Improving data entry in immunization databases; using immunization databases to identify children not receiving immunizations.

Edward Z. Tronick, MS, PhD; Associate Professor in the Department of Society, Human Development, and Health. Neurodevelopment of infants and children exposed to drugs in utero; depressive symptoms and mother-infant interaction.

Adjunct Faculty

Jennifer D. Allen, SD. Boston College School of Nursing.

Gary G. Bennett, MA, PhD. Duke University.

Robin J.R. Blatt, MPH. Applied Biogenuity Consultants.

Mary Jean Brown, SM, SD. National Center for Environmental Health.

Stephen L. Buka, SM, AM, SD. Brown University.

Johanna T. Dwyer, MS, SM, SD. Tufts Medical Center.

Michael L. Ganz, MS, MPhil, PhD. Abt Associates, Inc.

Roberta E. Goldman, MA, PhD. Brown University.

David T. Helm, MA, PhD. Children's Hospital Boston.

Daniel J. Kindlon, MS, PhD. Clinical Psychologist.

Lawrence C. Kleinman, MD, MPH. Quality Matters, Inc.

Michael G. Marmot, MBBS, MPH, PhD. University of London, United Kingdom.

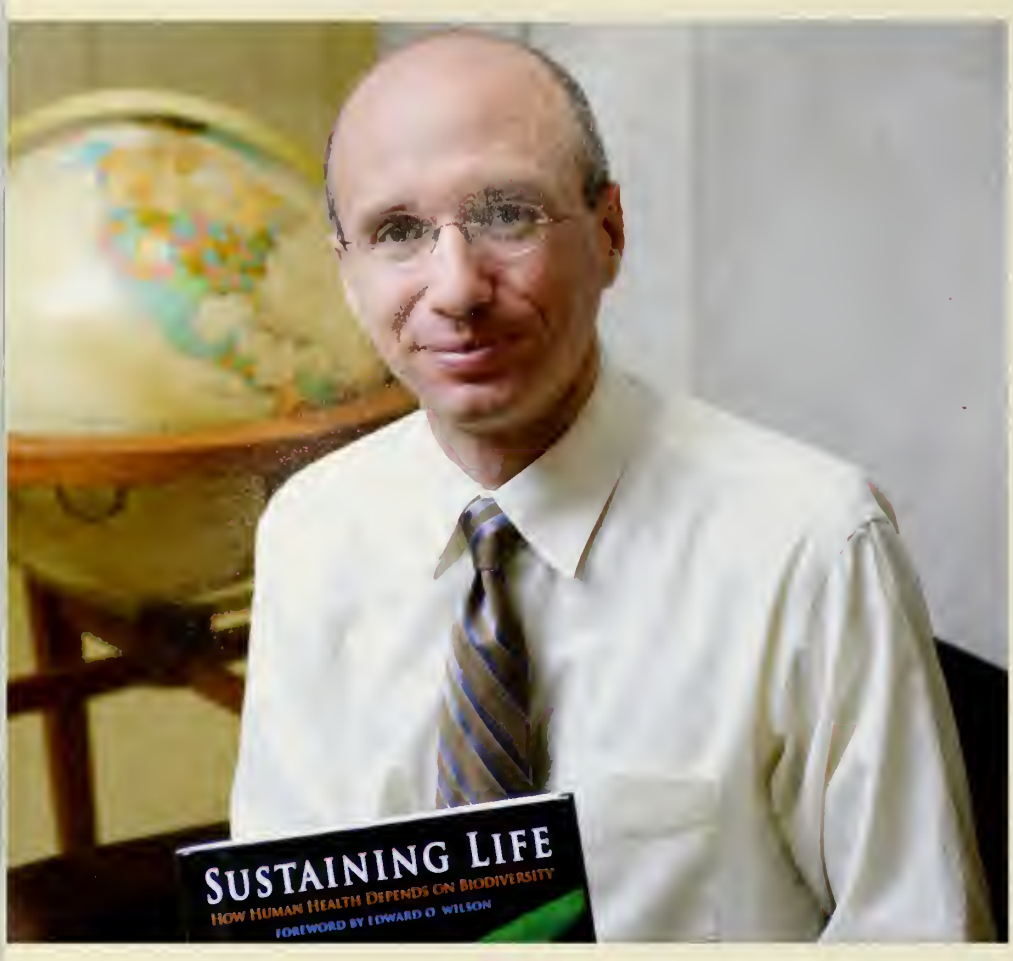
Karen E. Peterson, RD, SD. University of Michigan.

Norma M. Swenson, MPH. Consultant.

Lisa Tieszen, MA. Beth Israel Deaconess Medical Center.

Deborah K. Walker, EdM, EdD. Abt Associates, Inc.

Master of PUBLIC HEALTH PROGRAM



AARON BERNSTEIN

Master of public health student

"Loss of biodiversity is one of the greatest threats to public health in the twenty-first century, but this has gone largely unrecognized," asserts Aaron Bernstein. Over half of the most frequently prescribed drugs in the United States, for example, are derived from nature, he says, but with current extinction rates we may lose species that hold drugs for presently incurable diseases before we even know they exist. Biodiversity is also the substrate for such ecosystem services as air and water filtration performed by the species that live in forests and watersheds. "HSPH is one of few schools of public health that pays any attention to these issues, and that's why I'm here."

Aaron originally received degrees in human biology and music from Stanford University. He plays the viola and has studied music at Oxford. By the end of college, he was also interested in climate change, ozone depletion, and the loss of biodiversity. He went to medical school at the University of Chicago, where he began to pair his interests in global environment change with medicine.

"As a pediatrician I am primarily concerned with the future for our children," he says. HSPH has provided him with the quantitative methods and public policy knowledge to bring these issues to attention at the state and federal levels. After graduation Aaron will be on faculty at Children's Hospital and Harvard Medical School (HMS) and continue work at the HMS Center for Health and the Global Environment—caring for the present and future health of children.

THE MASTER OF PUBLIC HEALTH (MPH) DEGREE IS THE MOST WIDELY RECOGNIZED PROFESSIONAL CREDENTIAL FOR LEADERSHIP IN PUBLIC HEALTH. THE PROGRAM EMPHASIZES ACTIVE, STUDENT-DIRECTED LEARNING, PROBLEM SOLVING, AND THE ACQUISITION OF SKILLS ESSENTIAL TO THE PRACTICE OF PUBLIC HEALTH.

THE PROGRAM IS ORGANIZED AROUND seven career-oriented concentrations (see below). In addition to the common core curriculum, each concentration offers specialty electives and a selection of areas of interest, allowing students to explore in depth one or more spheres of relevance to their career goals. The concentrations and areas of interest enable students in the interdisciplinary MPH program to establish a second "home" in one of the school's academic departments, such as Health Policy and Management or Global Health and Population.

Coming from all parts of the world, MPH students bring a wide variety of backgrounds and experiences to the program. The majority of these students are health professionals, with a minimum of three or more years of work experience, who are preparing for advancement in their organizations or for transition into new fields. Applicants ordinarily hold a doctoral degree (or foreign degree equivalent) in medicine, dentistry, veterinary medicine, law, or other fields related to public health—for example, biology, other natural sciences, behavioral sciences, or social sciences. Individuals with a master's degree in nursing, social work, business administration, or a field closely related to public health (see above) and who have at least three years of health-related work experience may also be considered for admission to the program. Preference is given to applicants with clearly identified career goals relevant to the program and who demonstrate a strong academic

background. Those without the required professional training or experience should consider an 80-credit master of science program offered by one of the HSPH departments.

Students currently enrolled in MD, DO, DMD, or DDS programs (and some law students) who have a career interest in public health and/or preventive medicine are also eligible to apply for admission to the MPH program. Medical and dental students undertake the MPH program while on leave of absence between the third and fourth years of medical or dental school. They receive the MPH degree upon successful completion of both programs and conferral of the doctoral degree. The MPH program serves as a required academic year for residency training in general preventive medicine, aerospace medicine, or occupational and environmental medicine.

Students accepted to Harvard Law School may simultaneously pursue an MPH under Harvard's JD/MPH joint degree program. Prospective students should apply to the joint program either concurrently with their application to Harvard Law School or during their first semester of law school. HSPH course work begins in the summer following the first year of law school and continues over the next two years.

MPH students are required to complete a minimum of 42.5 course credits and must fulfill core requirements in the fundamental public health disciplines (see page 5) and a course on the ethical basis of the practice of public health. Within their selected concentration students choose a second tier of recommended or required courses and complete a practice course, which generally serves as the required culminating experience, following concentration guidelines. Beyond the program and concentration requirements, students are encouraged to consult with faculty advisers to choose elective courses best suited to their needs. Requirements and concentration guidelines are available from the Office for Educational Programs.

MPH candidates may complete the degree requirements on a full-time or part-time basis (or may change from one status to the other). Full-time students normally complete the program in two consecutive semesters (September through May). Part-time students complete the requirements for the degree over a period of two or three years. Students may elect to begin their course work in July by enrolling in the Summer Session for Public Health Studies; those interested in this option should contact the Office for Educational Programs for guidance.

A summer-only MPH program is also available for students in two concentrations: quantitative methods and clinical effectiveness. The program can be completed by taking courses in three consecutive enrollments in the Summer Session for Public Health Studies; students in this program can also take courses during the HSPH WinterSession. Students wishing to apply for the summer MPH in quantitative methods or clinical effectiveness must observe the same admissions deadlines as all MPH degree applicants.

Concentration goals and areas of interest are described below:

Clinical effectiveness Concerned with identifying the most appropriate, ethical, and cost-effective means of providing health care through prevention, early detection, or treatment, the concentration is designed to provide the analytic and quantitative training necessary to evaluate clinical practices. Major areas of professional interest for concentrators include clinical epidemiology and biostatistics, cost-effectiveness analysis, medical decision analysis, health services research, quality improvement in health care, and measurement of health-related quality of life. The concentration is limited to clinicians enrolled initially in the Summer Program in Clinical Effectiveness.

Along with the broad perspective the program offers on general aspects of public health, this training provides a basis for identifying the health policy implications and public health benefits of clinical investigations. The concentration prepares physicians for clinical research responsibilities and for leadership roles in evaluating and improving all aspects of health care delivery. Most graduates hold positions in academic medicine.

Family and community health This concentration focuses on the promotion of health and the prevention of disease, especially in more vulnerable populations. Course work emphasizes strategies for needs assessment and establishment of health objectives, data collection and analy-

sis, leadership skills, consultation, communication, advocacy, and policy formation in the public sector. Beyond the MPH core requirements students are encouraged to develop expertise in a focus area geared to their professional interests. Areas of interest include maternal and child health, women and health, mental health, violence and substance abuse, health disparities, community health, health promotion, and disease prevention.

The concentration prepares students for working in diverse spheres, including federal, state, and local government; advocacy groups; voluntary health organizations; and community-based primary care settings in the United States and other countries. Posts filled by graduates of this concentration include state health director; medical director of programs for child, adolescent, and women's health; health policy analyst; and health educator. Other graduates have gone on to academic positions.

Global health This concentration emphasizes the development of skills leading to the ability to understand and evaluate specific public health issues affecting populations in developing countries, explore strategic planning methods for both crisis management and the creation of policy initiatives, and examine their effects on national health systems. Because of the multisectoral nature of health improvement in developing countries, students are exposed to a wide range of disciplines and ideas, including demography and epidemiology, the organization of health systems, the ethical basis of resource allocation, political economy, health economics and financing, and health and human rights and humanitarian studies.

The program is intended to prepare health professionals with relevant prior experience for leadership roles in the practice of global health. Graduates of the program work in national ministries of health, international organizations, donor aid agencies, private voluntary organizations, research and academic institutions, and the private sector.

The program is intended to prepare health professionals with prior international health experience for leadership roles in the practice of international health, with a special emphasis on the populations in developing countries. Graduates of the program work in national ministries of health, international organizations, donor aid agencies, private voluntary organizations, research and academic institutions, and the private sector.

Health care management and policy This concentration offers training with either a management or a policy focus. In addition to fulfilling the MPH core requirements, students select from clusters of courses to gain depth in their chosen focus area. Students choosing the management focus take courses providing practical management skills, such as accounting, finance, operations, marketing, information systems, quality improvement, management of people, and strategy determination. Students selecting the policy focus take courses in health economics, political science, and applied policy in areas like payment systems, insurance, mental health and substance abuse, community health, and health promotion and disease prevention.

The concentration prepares students for leadership positions in health care organizations that provide direct care (such as hospitals, group practices, and home health agencies), those that pay for and/or organize health care (such as governments, health insurers, and health maintenance organizations), and those that supply direct-care providers (such as pharmaceutical companies and biotechnology firms). Program graduates fill many roles—from consultants and staff analysts to middle-management and executive positions.

Law and public health This concentration introduces lawyers to the science of public health, provides them with skills in analysis of public health problems, and allows them to design a curriculum that will meet their particular interests. Beyond the MPH core requirements, which include law-related courses, lawyers are encouraged to develop an area of interest by choosing elective courses in a specific field such as health care delivery or environmental health.

The concentration is designed to train leaders in the field of public health law. Graduates are prepared for careers in a variety of settings, including health or environmental law work in a law firm, nongovernmental organization, or in-house counsel's office; policy positions in local, state, and federal government; or posts in academia. The concentration is open to individuals who hold a U.S. or foreign law degree or who are pursuing a law degree at Harvard Law School (through the JD/MPH joint degree program).

Occupational and environmental health This concentration focuses on workplace and environmental hazards, the physiologic and biomechanical aspects of work, the risks posed by the interaction of genetic and environmental factors, and a practical approach to solving health problems in various work and community settings. The concentration features three areas of interest: occupational/environmental medicine, occupational health, and environmental health.

The program is designed for physicians and other professionals who intend to practice occupational/environmental medicine or to hold responsible positions in occupational and/or environmental policy and management. The occupational/environmental medicine area fulfills the first-year requirements of the two-year Occupational and Environmental Medicine Residency. This area is also intended for other physicians who wish to satisfy the didactic requirements of the American Board of Preventive Medicine for certification in occupational and environmental medicine. The requirements for the master of occupational health (MOH) degree are similar to those of the MPH in occupational medicine; physicians may elect either degree.

Quantitative methods In addition to a strong foundation in public health, the concentration provides students with the necessary quantitative and analytic skills to approach and solve problems in clinical and public health research and practice. The concentration emphasizes study design, data analysis, and the application of quantitative methods. Major areas of interest include epidemiology, biostatistics, decision sciences, demography, needs measurement, and program evaluation.

The program is geared toward health professionals requiring analytical and statistical skills for successful public health practice and research. It is designed for both mid-career health professionals and those in the early stages of their careers. The program prepares graduates to take on leadership roles in clinical and population-based health research in government, health care institutions, and private industry. Many graduates hold positions in academic medicine.

Contact Information

For more information about the MPH program or the summer MPH in quantitative methods or clinical effectiveness, please contact Roberta Gianfortoni, assistant dean for professional education, Office for Educational Programs, 677 Huntington Avenue, Boston, MA 02115, or visit the program website.
Phone: 617-432-0090
Fax: 617-432-3365
Email: roberta@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/mph

RELATED OFFERINGS
Master of occupational health, see page 13.
Occupational and Environmental Medicine Residency, see page 14.
Summer Program in Clinical Effectiveness, see page 59.
Summer Session for Public Health Studies, see page 59.

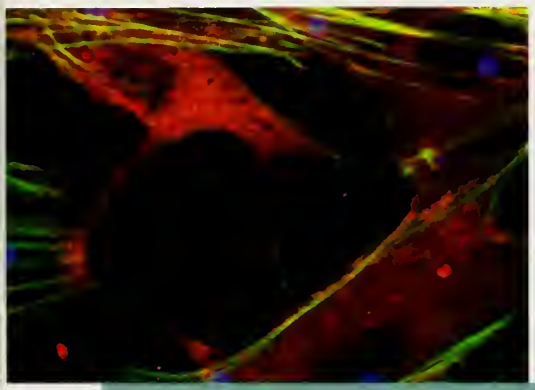
DIVISION OF BIOLOGICAL SCIENCES

THE DIVISION OF BIOLOGICAL SCIENCES IS AN UMBRELLA ORGANIZATION ENCOMPASSING THE HSPH DEPARTMENTS OF ENVIRONMENTAL HEALTH, GENETICS AND COMPLEX DISEASES, IMMUNOLOGY AND INFECTIOUS DISEASES, AND NUTRITION.

IN MOST OF THESE DEPARTMENTS, TWO doctoral degrees are offered: the doctor of philosophy (PhD) and the doctor of science (SD). The PhD programs generally center on laboratory-based investigation in the biological sciences, whereas the SD programs emphasize epidemiological analysis. The PhD program is administered by the Division of Biological Sciences.

Doctor of Philosophy in Biological Sciences in Public Health

Students wishing to study cellular and molecular biology or physiology as it pertains to major problems in public health should apply to the PhD Program in Biological Sciences in Public Health (BPH).



This program offers the PhD degree through the Harvard University Graduate School of Arts and Sciences.

Graduates ordinarily assume positions as faculty members and research scientists in graduate schools, medical schools, research institutes, or schools of public health. Career opportunities in the biological sciences as they apply to public health are expected to grow both in academia and in the biotechnology and pharmaceutical industries.

To qualify for admission, applicants must demonstrate strong enthusiasm and capacity for the vigorous pursuit of scientific knowledge. Minimum requirements include a bachelor's degree and undergraduate preparation in advanced-level biology and chemistry (both physical and organic), calculus, and physics appropriate for mastery of the biology material. Those deficient in one of these areas may be admitted provisionally on the condition that appropriate courses will be taken before and/or after entering the program. Applicants are required to take the GRE general test in time to meet the application deadline of December 8, 2009. Please note that Graduate School of Arts and Sciences application forms must be used when applying to the PhD Program in Biological Sciences in Public Health.

The BPH program offers a firm foundation in the basic biomedical sciences, as well as in epidemiology and biostatistics. The program also features interdisciplinary training, with students taking courses in several different departments to meet their individual requirements. All students complete courses in a minimum of four of the seven core areas (molecular biology, cell biology, biochemistry, genetics, physiology, toxicology/cancer cell biology, immunology/infectious diseases). Other requirements for the first two years of study include the following: courses in epidemiology, biostatistics, and the conduct of science; three ten-week laboratory rotations; and two critical-reading courses. Elective courses taken during the first two years cover principles of toxicology, introductory cancer biology, genetic toxicology, cell response to mutagens and carcinogens, human physiology, advanced respiratory physiology, advanced topics in physiology, immunology, cellular and molecular biology of parasites, and the science of human nutrition. At the end of the second year, students must take a preliminary qualifying examination to assess their ability and preparation for an original, laboratory-based scientific investigation.

COURSES OF INSTRUCTION

Complete course descriptions are available at http://www.register.fas.harvard.edu/Courses/BiologicalSciencesinPublicHealth.html.

Students must also write and defend a dissertation, generally within five or six years of beginning the program.

Participating HSPH departments offer PhD programs in the following areas:

- genetics and complex diseases (molecular mechanisms of adaptive responses to stress; molecular and cellular toxicology; radiobiology; nutritional biochemistry; genetic and molecular mechanisms of chronic diseases such as obesity, diabetes, and cancer)
- environmental health (molecular and integrative physiological sciences)
- immunology and infectious diseases (immunology and molecular biology of parasitic and other infections)
- nutrition (biochemistry; cardiovascular biology)

All students admitted to the PhD program receive a stipend, as well as tuition and health insurance support. Students are encouraged to apply for fellowships from outside sources since certain external fellowships provide higher stipends. While funds to support international students are limited, one special scholarship is available each year for a student from a developing, sub-Saharan African country. Harvard University presidential funds also support international doctoral students. A university-wide fellowship program provides funding to qualified underrepresented minority students in the sciences.

Contact Information

For the PhD Program in Biological Sciences in Public Health, online submissions are encouraged, using the Graduate School of Arts and Sciences (GSAS) application form available at the web address below:
Web: http://www.gsas.harvard.edu/hils/admissions_apply.html

Applicants with specific questions about the PhD program may contact Ruth Kenworthy, administrator, Division of Biological Sciences, 665 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-2932
Fax: 617-432-4033
Email: rkenwort@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/bph

DIVISION OF PUBLIC HEALTH PRACTICE

THE DIVISION OF PUBLIC HEALTH PRACTICE (DPHP) was created in 1997 in response to a national call by the Institute of Medicine for dedication to public health practice. The mission of the division is to translate passion and learning into advances that protect the health of all. DPHP serves as a bridge between academia and the community through initiatives such as MassCONECT (Massachusetts Community Networks to Eliminate Cancer Disparities through Education, Research, and Training), the Tobacco Control Research Program, health disparities research, the Leadership Initiative, the HSPH Center for Public Health Preparedness, investigation of health care for homeless populations, and promotion of community-based collaborative research and linkages with Harvard Catalyst, the university's clinical and translational science center. The division also helps to prepare students for leadership positions; nurtures community partnerships to meet health challenges; and works to strengthen its commitment to service, education, and research opportunities for the school's students, faculty, and practitioners. DPHP collaborates with the HSPH Office for Educational Programs to provide practice opportunities for HSPH students by matching them with appropriate host agencies, institutions, and community organizations. The division supports the Student Advisory

Council and sponsors a number of events, including the Barry R. Bloom Public Health Practice Leadership Speaker Series, Community Partnership Day and Agency Information Fair, the Julius B. Richmond Award and Lecture, and the William A. Hinton Lecture.

Contact Information

For more information on the Division of Public Health Practice or the programs and practice opportunities sponsored by the division, please visit the web address below:
http://www.hsph.harvard.edu/academics/public-health-practice
Phone: 617-495-4000

INTERDISCIPLINARY CONCENTRATION IN OBESITY EPIDEMIOLOGY AND PREVENTION

THIS INTERDISCIPLINARY CONCENTRATION is designed for students interested in training in the theoretical, methodological, and applied knowledge and skills necessary to conduct obesity-related epidemiologic and prevention research. The concentration includes obesity epidemiology and prevention in international settings. Areas of training include assessment of obesity in individuals and populations; biological and social determinants of obesity; epidemiologic and prevention study designs; health and social consequences of obesity; worksite-, community-, and school-based interventions; gene-environment interactions; and global obesity epidemiology and prevention. As the concentration does not offer a degree, prospective students must apply to a degree program, which can be in any of three departments: Nutrition, Epidemiology, or Society, Human Development, and Health. Students must fulfill the requirements of the home department, which issues the degree, and the requirements of the concentration, which include core courses in nutritional and obesity epidemiology and obesity prevention. The concentration is limited to doctoral and two-year master's students; 10 credits are required.

Contact Information

For more information about research and training in obesity epidemiology and prevention, please contact the Obesity Epidemiology and Prevention Program Office, Department of Nutrition, 655 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-1333
Fax: 617-432-2435

INTERDISCIPLINARY CONCENTRATION IN MATERNAL AND CHILD HEALTH/CHILDREN, YOUTH, AND FAMILIES

THE GOAL OF THE CONCENTRATION IS TO improve the health of children and their families through educating leaders in maternal and child health/children, youth, and families (MCH/CYF). This interdepartmental concentration is geared toward students who desire careers in public health programs for children and their families, and those interested in research and/or teaching in this area. The curriculum focuses on the health problems of the target population, programmatic and policy responses, appropriate research techniques, and specific leadership skills in courses in the four participating departments: Society, Human Development, and Health, Global Health and Population, Nutrition, and Epidemiology. The MCH/CYF concentration consists of four areas of study: MCH/CYF and human development, MCH/CYF and nutrition, child rights and global health, and characterizing the health problems of children and their families. As the concentration does not offer a degree, prospective students must apply to a department-based degree program and must complete the requirements for both the academic program and the concentration. The number of required credits for the concentration ranges from 7.5 to 10 credits, depending on the student's degree program.

Contact Information

For more information about research and training in maternal and child health/children, youth, and families, please contact Trish Lavoie, program administrator, Department of Society, Human Development, and Health, 665 Huntington Avenue, Boston, MA 02115.
Phone: (617) 432-0964
Fax: (617) 432-3755
Email: tlavoie@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/mch-concentration/mch-concentration

INTERDISCIPLINARY CONCENTRATION IN THE EPIDEMIOLOGY OF INFECTIOUS DISEASE

EDUCATION AND RESEARCH ON ASPECTS of infectious disease occur in a number of HSPH departments, including the Departments of Biostatistics, Epidemiology, Global Health and Population, Health Policy and Management, and Immunology and Infectious Diseases. These departments participate in the interdisciplinary concentration in the epidemiology of infectious disease, which focuses on population studies incorporating both epidemiologic and laboratory methods. This concentration is intended to provide training for those students who desire careers in research and teaching in infectious disease. As the concentration is a nondegree program, prospective students must apply to a program in one of the participating departments, which will issue the degree. Upon matriculation students may then elect to participate in this concentration. Students are responsible for fulfilling the requirements of the academic program within the home department in addition to the requirements of the concentration. Students who complete the required 15 credits receive a certificate.

Contact Information

For more information about research and training in the epidemiology of infectious disease, please contact Felisa Nobles, program coordinator, Department of Epidemiology, 677 Huntington Avenue, Boston, MA 02115, or visit the concentration website.
Phone: 617-432-1498
Fax: 617-566-7805
Email: fnobles@hsph.harvard.edu
Web: http://www.idepi.hsph.harvard.edu

INTERDISCIPLINARY CONCENTRATION IN WOMEN, GENDER, AND HEALTH

THIS INTERDISCIPLINARY CONCENTRATION is geared toward students who desire careers in research, teaching, and programs related to women, gender, and health. Addressing issues of women, gender, and health (WGH) requires the study of the health of women and girls—and men and boys—throughout the life course, with gender, gender equality, and biology understood as important and interacting determinants of well-being and disease. Areas of study also include gender and gender inequality in relation to individuals' treatment by and participation in health and medical care systems; the physical, economic, and social conditions in which individuals live; and their ability to promote the health of their families, their communities, and themselves. Inherent within these studies is the protection of human rights as fundamental to health and the recognition of diversity and inequality among women—and men—in relation to race/ethnicity, nationality, class, sexuality, and age. As the concentration does not offer a degree, prospective students must apply to a degree program, which can be in any department. Students must fulfill the requirements of the home department, which issues the degree, and the requirements of the concentration, which include core courses in women, gender, and health; gender analysis; and women's health.

COURSES OF INSTRUCTION

Please note that the courses listed are subject to change.

Women, Gender, and Health

Advanced Topics in Women, Gender, and Health

Women, Gender, and Health: Critical Issues in Mental Health

Women, Gender, and Health: Introductory Perspectives

Issues in Mental Health: Independent Study

Independent Study

Contact Information

For more information about research and training in women, gender, and health, please contact the WGH Program Office, Room 1202, 665 Huntington Avenue, Boston, MA 02115, or visit the concentration website.
Phone: 617-432-3690
Fax: 617-432-3755
Email: wgh@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/wgh

RESEARCH CENTERS

HSPH HAS ESTABLISHED A NUMBER OF INSTITUTES AND CENTERS TO ADVANCE RESEARCH IN areas of importance to public health. These efforts tend to be multidisciplinary in their approach, bringing together faculty members from several HSPH departments and in some cases from several faculties at Harvard University. Faculty affiliated with the centers offer courses in their field of interest through the school's academic departments and often provide opportunities for student involvement in research. Schoolwide research groups currently include the Center for Decision Science, Center for Health Communication, François-Xavier Bagnoud Center for Health and Human Rights, HSPH AIDS Initiative, Harvard Center for Population and Development Studies, and Harvard Injury Control Research Center.

SUMMER PROGRAM IN CLINICAL EFFECTIVENESS

THE SUMMER PROGRAM IN CLINICAL effectiveness—affiliated with Brigham and Women's Hospital, Massachusetts General Hospital, and Harvard Medical School—is intended for physicians who have completed their residencies and wish to obtain the quantitative and analytical skills needed for careers in clinical research. Candidates must be fellows or faculty members and are usually sponsored by their clinical departments or divisions. Students attend an intensive, seven-week, 15-credit summer program, comprising courses in biostatistics, epidemiology, and health policy and management. Upon completion of the summer program, qualified participants who apply and are admitted to a degree program may apply these academic credits toward the requirements for either a master of public health (MPH) or a master of science (SM) degree.

HSPH offers two specifically relevant degree programs: the MPH with a concentration in clinical effectiveness and the SM in epidemiology, with an area of interest in clinical epidemiology. Qualified participants may fulfill requirements for the summer-only SM in epidemiology by attending classes during a second summer period and completing a supervised research project (5–12.5 credits). Qualified participants may fulfill requirements for the MPH in clinical effectiveness by attending classes during second and third summer periods and by completing a supervised practicum (2.5–7.5 credits).

RELATED OFFERINGS
Clinical epidemiology area of interest, Department of Epidemiology, see page 19.

Contact Information

For information about the Summer Program in Clinical Effectiveness, or to request application materials, please contact Barbara Rosen, administrator, Program in Clinical Effectiveness, Division of General Medicine and Primary Care, Department of Medicine, Brigham and Women's Hospital, 1620 Tremont Street, Boston, MA 02120.
Phone: 617-732-5648
Fax: 617-732-5344
Email: brosen@partners.org
Web: http://www.hsph.harvard.edu/clineff

SUMMER SESSION FOR PUBLIC HEALTH STUDIES

THE HARVARD SUMMER SESSION FOR PUBLIC HEALTH STUDIES INTRODUCES STUDENTS TO the core areas of public health in two intensive sessions. Courses in the program help students develop the ability to define, assess, and evaluate the health needs of populations; to participate in the development of health policy; and to ensure the delivery of health services.

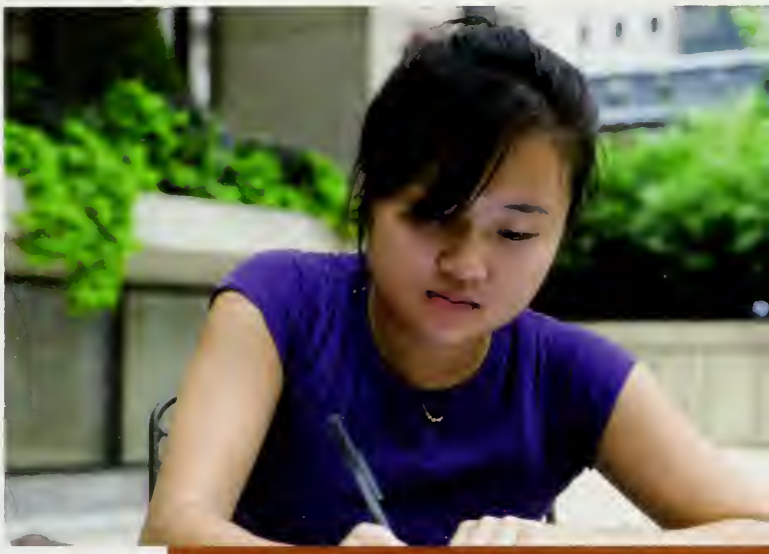
Students in the Summer Session attend one or two three-week sessions in July and August. The 2009 curriculum includes courses in biostatistics, epidemiology, health care management, health policy, ethics, environmental health, global health, and social and behavioral science. Each course offers 2.5 credits, and the maximum recommended course load is 5 credits (two courses) per session. Because the course work is very intensive and fast paced, students registered for two courses in a session should not have other work commitments.

The Summer Session is intended for health professionals in training or those who are considering a midcareer change into public health and feel the need to strengthen their skills. Participants include public health professionals, primary care practitioners, physicians engaged in the evaluation of health care delivery and management, physicians in training (including preventive medicine residents and medical students in an MD/MPH joint-degree program), and candidates for a part-time MPH program. Students accepted for admission to an HSPH degree program may choose to begin their studies early by enrolling in the Summer Session; these students will have greater flexibility in course selection during the academic year. Other students may subsequently seek admission to an HSPH degree program. Students eligible for the MPH in the quantitative methods or clinical effectiveness concentrations may apply for a summer-only MPH, which must be completed in three consecutive summers.

Contact Information

For more information about the Summer Session, please contact Nancy Perna, administrative assistant for summer programs, Office of Educational Programs, 677 Huntington Avenue, Boston, MA 02115, or visit the program website.
Phone: 617-432-0091
Fax: 617-432-3365
Email: summer@hsph.harvard.edu
(specify Summer Session on subject line)
Web: http://www.hsph.harvard.edu/summer/brochure

For more information about the summer-only MPH degree program, please contact Roberta Gianfortoni, assistant dean for professional education, Office for Educational Programs, 677 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-0090
Fax: 617-432-3365
Email: roberta@hsph.harvard.edu



RELATED OFFERINGS
MPH concentrations in clinical effectiveness and in quantitative methods, see pages 53 and 55.

Admission to Degree Programs

The admissions information in this section pertains to applications for degree programs offered by the Harvard School of Public Health. Applicants should contact the Admissions Office or consult the web for complete instructions and application forms. Information on HSPH minimum entrance requirements can be found on page 5. Note that application forms for PhD programs, offered under the auspices of the Harvard University Graduate School of Arts and Sciences (GSAS), are different from those used by applicants to programs administered by HSPH; these forms must be obtained directly from GSAS.

HSPH Application Deadlines

Applications may be submitted beginning on September 1, 2009.

December 15, 2009, is the deadline for complete applications for all HSPH doctoral (SD and DPH), master of occupational health (MOH), and master of science (SM) programs except as explained below.

December 15 is also the deadline for applications to the master of public health (MPH) and SM in health care management programs in the priority admission cycle. Applicants are strongly encouraged to submit their applications by November 27, 2009, to allow time for all their credentials to arrive by the December 15 deadline.

January 8, 2010, is the deadline for completing applications to the MPH program for review in a second cycle. February 15, 2010, is the deadline for completing applications to the SM in health care management program for review in a second cycle. Applicants should be aware that these degree programs may fill to capacity during the priority admission cycle.

Participants in the Summer Clinical Effectiveness and Summer Session programs matriculating in the 2010 summer program and wishing to apply for degree candidacy must meet the application deadlines outlined above.

Applicants to the MPH or MOH programs who wish to participate in the Occupational and Environmental Medicine Residency must apply by October 5, 2009.

Application Procedures and Requirements

Application to the Harvard School of Public Health is made through the centralized Schools of Public Health Application Service (SOPHAS). For more information about this process, please consult the HSPH admissions website (http://www.hsph.harvard.edu/admissions).

Required application materials consist of the following:

- A completed and signed application form, a resume, and a statement of purpose written by the applicant. The statement should describe the applicant's academic and professional history, area of interest at HSPH, reasons for wanting to enroll in the degree program, and professional or academic career plans upon completion of the program. The SM in health care management, MPH, and JD/MPH programs have specific requirements for the statement of purpose. Please visit the admissions website for more information.

- Official transcripts from all colleges, graduate schools, and/or professional schools attended, whether or not the courses taken appear to be relevant to a degree in public health. Applicants are expected to have a distinguished undergraduate record, as well as excellent performance in any graduate work undertaken.

- Letters of recommendation from at least three people who are well acquainted with the applicant's academic work and/or professional experience (recommendation forms are provided in the application).

- Official scores of the Graduate Record Examination (GRE). While GRE scores are strongly preferred, some other tests may be substituted in circumstances specified in the application. The requirement for scores from a standardized test will not be waived on the basis of academic or professional background.

- Official scores of the Test of English as a Foreign Language (TOEFL), if applicable. Applicants (including those who have been U.S. citizens or permanent residents for less than one year) from countries where English is not the language of instruction must submit a score from the TOEFL. Those who have already taken the TOEFL may submit the score as long as it is not more than two years old. The International English Language Testing System (IELTS) exam will be accepted if the applicant's score is 7.0 or above.

- A nonrefundable application fee to SOPHAS (the amount will vary according to the number of schools designated to receive the application). HSPH does not charge an application fee.

Applicants may apply to only one degree program and must satisfy the requirements of the department or program to which they are applying. Those applying to the JD/MPH joint degree program with Harvard Law School or an MD/MPH combined degree program with Harvard Medical School or another medical school must satisfy the entrance requirements to both schools. Applicants to doctoral programs must demonstrate the ability to undertake original research. All prospective students must apply for either full-time or part-time status. Most international students are eligible for full-time study only.

Admission is granted for the fall semester of a particular year (currently September 2010). Students unable to enroll at that time may request a deferral but may be required to reapply.

Application Review

Applicants are notified as soon as possible (in writing or electronically) about the status of their application. The Admissions Office will either confirm that an application is ready for review or will specify any missing documents. The decision of the Committee on Admissions and Degrees is final and is not subject to appeal.

For all HSPH programs the Committee on Admissions and Degrees considers the academic ability of applicants, the relevance of their previous education and experience, and their overall qualifications for graduate education in public health, including those qualities of character that reflect upon an individual's suitability to be a public health professional. In decisions about admission and financial aid, HSPH does not discriminate against individuals on the basis of race, color, gender identity, sexual orientation, religion, age, national or ethnic origin, political beliefs, veteran status, or disability.

The increased participation of underrepresented groups in public health practice and research is essential to the advancement of health, and the school is committed to expanding the diversity of its faculty, staff, and student body.

Tuition Deposit and Financial Certification

Applicants who are granted admission must submit a $500 tuition deposit when confirming acceptance of the offer of admission. This deposit, which is nonrefundable, will be applied toward the student's tuition and fees.

Accepted applicants who are not U.S. citizens or permanent residents must demonstrate that sufficient funds are available in U.S. currency to pay the costs (tuition, fees, and living expenses) of the full period of their academic program. International students supported by personal, family, or sponsors' funds not paid directly to Harvard University are required to deposit and retain adequate funds in a Boston-area bank in an account bearing the student's name. Students bringing their families to the United States must transfer and certify adequate funds for their support as well. (Please see page 63 for an estimate of living expenses in the Boston area.)

Admission to Nondegree Status

Affiliates

Harvard faculty and staff, employees of Harvard-affiliated hospitals, HSPH alumni, and certain other Boston-area public health professionals may register for a maximum of 10 credits per semester as nondegree affiliates of the school. Affiliates must register in person at the HSPH Registrar's Office.

Enrollment of affiliate students in specific courses is subject to the availability of space and permission of the instructor and the registrar; if classes fill to capacity, preference is given to HSPH degree candidates. Payment is on a per-credit basis and is due at the time of registration. Payment is not refundable unless the student is unable to take the desired course because it is filled to capacity. Affiliate students may neither audit courses nor cross-register at other Harvard schools or MIT.

Tuition and Fees, July 2009–June 2010

Per-credit assessment (full-time, part-time, and special students and affiliates)	$ 850 per credit
Tuition for full-time 42.5-credit master's degree students	$36,125 per year
Tuition for full-time 80-credit master's degree students (40 credits per year required)	$34,000 per year
Tuition for nonresidential master of science in health care management (2009–11 cohort)	$59,160 total for two-year program
Tuition for full-time resident doctoral students (40 credits per year required)	
Full-time, years one and two	$34,000 per year
Full-time reduced, year three	$17,000 per year
Facilities fee, year four to thesis defense	$ 4,250 per year
Dissertation defense fee (final semester before graduation)	$ 1,875 final semester
Tuition for part-time resident doctoral students	
Credits 1–80	$ 850 per credit
Credits 81–120	$ 425 per credit
Credits 121 to thesis defense	$ 2,125 per semester
Dissertation defense fee (final semester before graduation)	$ 1,875 final semester
Tuition for nonresident doctoral students	$ 2,350 per year
Summer matriculation (2009) (includes HSPH summer courses, Summer Institute, clinical effectiveness, summer SM in epidemiology, and doctoral 5-credit research)	$ 850 per credit
Fees	
Registration fee (summer, spring, and fall)	$ 125 per semester
Late registration fee	$ 80
Leave of absence fee	$ 125 per semester
Health fees (see page 62)	
Academic records fee	$ 10 one-time fee

Special Students

Individuals who do not fall into one of the categories listed above may apply for special student status. Applicants for special student status are subject to the same admission and registration requirements, deadlines, and procedures as applicants for degree candidacy. U.S. citizens and permanent residents may apply to the Admissions Office for full-time or part-time special student status. As noted previously, foreign applicants are eligible for full-time status only. Admission to special student status is limited to one academic year. The deadline for applying for special student status is December 15, 2009.

Subsequent Application for Degree Candidacy

Affiliates and special students wishing to be admitted to degree candidacy must apply and will be considered on the same basis as other applicants for admission. At the time of their application, affiliates and special students who have taken courses at the school within the preceding five years may count up to 20 credits retroactively as part of the academic credit requirements.

Up to 20 credits of tuition previously paid to HSPH may be counted toward the school's tuition requirement for the degree program.

Financial Aid

Estimated Student Expenses

The budget information on page 63 is intended to provide students with an estimate of how much it will cost to spend nine months at HSPH. These figures are for the 2009–10 academic year; applicants for subsequent years should anticipate increases.

Matriculation in Summer Programs

Tuition for the Clinical Effectiveness Program and the Summer Session for Public Health Studies in 2009 is $850 per credit. HSPH offers a special program in English communication in advance of the regular orientation for entering students; tuition for the Professional English Communication Seminar is $850 for summer 2009. Living expenses, including rent, are about $1,895 a month.

Sources of Financial Aid

The Office of Student Financial Services and academic departments make every effort to assist students in finding resources to finance their education at HSPH. It should be noted that the school's financial aid budget is extremely limited. Students are urged to investigate all sources of support, including employers, government agencies, and civil and religious organizations.

Financial aid is available in the form of grants, scholarships, loans, and work programs, as follows:

Grants and scholarships The Office of Student Financial Services and some academic departments may have grants or departmental scholarships that cover partial or full tuition; some grants also provide a stipend. Eligibility is generally based on career goals, academic merit, experience, and U.S. citizenship or permanent residency. Please contact the department to which you are applying for additional information.

The university offers a number of restricted scholarships to students who meet specific criteria. Please refer to the HSPH financial aid application for more information. An HSPH application for financial aid is required.

Federal student loans The Office of Student Financial Services administers the Federal Direct Loan and Federal Perkins Loan programs. The maximum amount a student may receive under the direct loan program is $20,500 per academic year. Some full-time students may be eligible for an additional $12,500. Students with extreme financial need may also be eligible for a Perkins loan up to $6,000. To apply for these loan programs, a student must

- be a U.S. citizen or eligible nonresident
- not be in default on a prior federal loan or owe a refund on a federal student grant
- be enrolled at least half-time (10 or more credits per semester)
- complete the financial aid application process

Work programs Some students may obtain part-time employment as research or teaching assistants in their academic departments. Additionally the school participates in the Federal Work-Study Program, which subsidizes between 50 percent and 75 percent of the on- or off-campus employer's costs. Eligibility for this program is the same as for federal student loans.

Please refer to the student financial services website for additional and updated information about loan and work programs.

Health Fees, August 2009–July 2010

University Health Services (UHS) Fee	Semester	Year
Individual	$563	$1,126
Family (student plus spouse)		2,700
Family (student plus spouse and one child)		3,394

The University Health Services (UHS) provides comprehensive prepaid medical care such as physical examinations, physician visits, laboratory tests, psychological counseling, and emergency services. The UHS fee is compulsory for all degree candidates and special students registered for more than 10 credits in a semester. Others may elect to waive UHS coverage; this must be done before September 30 for fall and February 28 for spring.

Blue Cross/Blue Shield (BC/BS) Medical Insurance	Semester	Year
Individual	$857	$1,714
Family (student plus spouse)		3,866
Family (student plus spouse and one child)		5,106

The Blue Cross/Blue Shield (BC/BS) plan provides extensive benefits for ambulatory and inpatient care not offered at UHS. BC/BS coverage is compulsory for all nonimmigrant international students and for all other students who do not have comparable insurance. International students whose spouse and/or children will also be living in the United States are required to enroll in the family plan. U.S. students who have comparable insurance may elect to waive BC/BS coverage; this must be done by September 30 for fall and February 28 for spring.

Note: UHS and BC/BS coverage extends from August 1 through July 31.

Registration

Students receive course descriptions and information about course meeting times, registration procedures and requirements, course load requirements, and payment of tuition and fees prior to registration. Every new resident degree candidate is expected to check in, in person, on August 24, 2009, for the 2009–10 academic year.

Cross-Registration

HSPH students may enroll in courses offered by the other Harvard faculties, MIT, and the Fletcher School of Law and Diplomacy at Tufts University. Students intending to cross-register should be aware that registration deadlines vary from school to school; these students must conform to the registration requirements of the school into which they are cross-registering as well as those of HSPH.

Harvard University maintains an online catalog of all courses offered at the university. This catalog is searchable by school, topic, time, and instructor. Also listed at this site are relevant, school-specific cross-registration policies and credit equivalencies. The address for the site is the following: https://crossreg.harvard.edu.

Contact Information

The HSPH application is available at the web address below:
Web: http://www.sophas.org

Prospective degree candidates or special students who wish to request information about applying, have questions about admission requirements, require assistance with the application process, or wish to visit the school should contact the HSPH Admissions Office, 158 Longwood Avenue, Boston, MA 02115, or visit the office website.
Phone: 617-432-1031
Fax: 617-432-7080
Email: admisofc@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/admissions

For more information about the financial aid application process, please contact the HSPH Office of Student Financial Services, 708 Huntington Avenue, Boston, MA 02115, or visit the office website.
Phone: 617-432-1867
Fax: 617-432-5431
Email: osfs@hsph.harvard.edu
Web: http://www.hsph.harvard. edu/administrative-offices/student-financial-services

For information about registration, billing procedures, admission to affiliate status, or policies regarding cross-registration, please contact the HSPH Registrar's Office, 677 Huntington Avenue, Boston, MA 02115, or visit the office website.
Phone: 617-432-1032
Fax: 617-432-2009
Email: registra@hsph.harvard.edu
Web: http://www.hsph.harvard.edu/registrar

2009–10 Student Expense Budget

Per-credit tuition assessment = $850		42.5-credit master's programs	Doctoral and other master's programs
Full-time tuition		$36,125	$34,000
University Health Services fee[1]	$ 563 per semester	$ 1,126	$ 1,126
BC/BS health insurance fee[2]	$ 857 per semester	$ 1,714	$ 1,714
Registration fee	$ 125 per semester	$ 250	$ 250
Books/supplies	$ 688 per semester	$ 1,376	$ 1,376
Living allowances			
Rent/utilities	$1,086 per month	$ 9,774	$ 9,774
Food	$ 336 per month	$ 3,020	$ 3,020
Personal	$ 395 per month	$ 3,554	$ 3,554
Local transportation	$ 78 per month	$ 703	$ 703
SUBTOTAL[3]		**$57,642**	**$55,517**
Federal student loan fees[4]	1.5%	$ 308	$ 308
TOTAL		**$57,950**	**$55,825**

1. Part-time students taking 10 credits or fewer may waive the University Health Services fee if a waiver form is completed prior to registration. Students with a spouse and/or children may request family coverage at a fee of $2,700 for a student and spouse; $1,820 for a student and child; $3,394 for a student, spouse, and child; and $3,742 for a student, spouse, and children.
2. The BC/BS health insurance fee can be waived upon proof of comparable coverage. Students with a spouse and/or children may request family coverage at a fee of $3,866 for a student and spouse; $2,954 for a student and child; $5,106 for a student, spouse, and child; and $5,728 for a student, spouse, and children.
3. International students in the 42.5-credit master's programs must be able to demonstrate a nine-month level of support of $57,642 prior to the issuance of an appropriate visa. Other master's degree and doctoral candidates must demonstrate a twelve-month support level of at least $61,199. Students with additional family members must demonstrate the following levels of support:

	Student & spouse	Student & child	Student, spouse, & child*	Student, spouse, & 2 children*
Nine months (42.5-credit programs)	$65,849	$63,376	$68,973	$71,293
Twelve months (42.5-credit programs)	$73,026	$70,318	$76,540	$79,310
Twelve months (multiyear programs)	$70,901	$68,193	$74,415	$77,185

*For each additional child, add $1,485 for the nine-month and $1,980 for the twelve-month budget.

4. Loan fees are based on borrowing $20,500 in Federal Direct Loans, available to U.S. citizens and permanent residents only.

For more information about student health insurance, please contact the Student Insurance Office, Harvard University Health Services, 75 Mt. Auburn Street, Cambridge, MA 02138, or visit the office website.
Phone: 617-495-2008
Fax: 617-496-6125
Web: http://www.uhs.harvard.edu

For the PhD programs online submissions are encouraged, using the Graduate School of Arts and Sciences (GSAS) application form available at the web address below:
Web: http://www.gsas.harvard.edu/hils/admissions_apply.html

Boston, Massachusetts

The Harvard School of Public Health is located in Boston, Massachusetts, an important center of American history, culture, commerce, and education. Boston is New England's largest city and one of America's oldest. A wealth of historical buildings and sites evokes the city's colonial past while providing a striking contrast to the skyscrapers of the business district. The Greater Boston area is home to more than a hundred colleges and universities and many renowned teaching and research hospitals.

The area hosts major art museums, museums devoted to science and children, the famous Boston Symphony and Boston Pops, several professional theater companies, the Boston Ballet, and a number of professional sports teams. The city also offers elegant shopping and diverse dining, from casual ethnic restaurants to haute cuisine. Compact in scale, Boston invites walking but furnishes extensive public transportation.

The proximity of Cape Cod and Maine beaches, the mountains of Vermont and New Hampshire, and the charming villages of New England add to the appeal of Boston, one of America's most desirable places to live and study.

Harvard University

Founded in 1636, Harvard University is the oldest institution of higher learning in the United States. It has educated seven presidents of the United States, and its faculty has produced more than forty Nobel laureates. Today Harvard has an enrollment of more than 20,000 degree candidates. Including HSPH, the university has ten graduate and professional schools. Its ninety individual collections constitute the largest academic library in the world. Ten art and science museums further enrich the quality of intellectual life.

The university has campuses both in Cambridge, Massachusetts, and in Boston.

Resources and Services for HSPH Students

The school's main buildings for research, teaching, and administration are located in the heart of Boston's hospital district and Harvard University's Longwood campus. The facilities adjoin those of Harvard's Medical School, School of Dental Medicine, and Francis A. Countway Library of Medicine and are near Children's Hospital Medical Center, Beth Israel Deaconess Hospital, Brigham and Women's Hospital, and other Harvard-affiliated hospitals. The school is within walking distance of many cultural institutions, such as Boston's Museum of Fine Arts, and public transportation is readily available to other parts of Boston and Cambridge, where students may cross-register for courses at other Harvard schools and at MIT. A shuttle bus runs between the Longwood campus and Harvard Yard in Cambridge.

Francis A. Countway Library of Medicine

The Countway Library is the principal provider of library services to the school and is open every day (except for holidays) for work and study. One of the largest medical libraries in the world, the Countway houses over 630,000 bound volumes, 3,500 current biomedical journal titles, and 10,000 noncurrent titles. The library's website provides access to additional full-text journals in the biosciences and medicine and to many electronic databases. The Countway also owns an extensive collection of historical materials dating from the fifteenth century. Students have borrowing privileges throughout the Harvard University library system. The Boston Public Library, MIT libraries, and other area libraries add to the total book and periodical resources available.

Instructional Computing Facility

The HSPH Instructional Computing Facility is dedicated to serving the course work and research computing needs of the school's students and faculty. Resources include SUN Unix computers, 200 IBM personal computers, a Novell network, laser printers, an OCR scanner, and a 392 CPU high-performance research computing cluster; a wide array of software, including statistical packages, programming languages, analytical programs, and word-processing packages; and services such as antivirus software, email, wireless Internet connectivity, user assistance, short courses, and computer accounts for funded research. Many academic departments also provide computing resources for their students. Additional services, such as computer classes, user groups, technical support, and purchase of discounted hardware and software, are available through the offices of Harvard's University Information Systems.

Office for Student Affairs

The Office for Student Affairs (OSA) provides a variety of support services and offers educational, social, cultural, and academic programs to enhance the student experience at HSPH. Staff members are available to respond to the needs of individual students as they deal with the many demands of their academic and personal

lives. The staff helps students and their families who have questions about living in Boston and the United States and also assists all students in adjusting to life here. Through a variety of programs the office works to support a sense of community for students across the school. OSA sponsors noncredit academic support seminars on such topics as time management and dissertation writing and can refer students to other sources of academic and personal support. The office also works closely with the HSPH Student Government and other student groups to address collective concerns. Another activity sponsored by the office is Global Chat, a seminar series featuring experts from around the world, including HSPH students, who share their experiences in an informal setting. The office also oversees the assignment and leasing processes for Shattuck International House and provides assistance to students with disabilities.

Student housing The Henry Lee Shattuck International House, available to both domestic and international students, is operated by the school on a nonprofit basis for its full-time students and their families. In addition to providing living quarters, the facility offers a supportive environment; students serving as resident community advisers help to organize house activities and provide assistance. Located within a ten-minute walking distance of the school, the apartment complex consists of three buildings with seventy furnished one-bedroom and two-bedroom apartments that accommodate single students, roommates, and families. Several apartments are accessible to those with disabilities. All apartments have private kitchens and baths, free Internet and email access via a data link to the school, two telephone lines, and interior cable access. Shared facilities include a computer room with a printer and copy machine, a library/reading room, an exercise room, a function room, a children's playroom, a laundry room, an indoor bicycle storage area, a piano room, a TV room with satellite TV and DVD, a recycling area, and an outdoor playground. Harvard Real Estate Services also offers a wide range of housing options in both Cambridge and Boston.

Students with disabilities The Office for Student Affairs furnishes a range of services to students with documented disabilities, including interpreters, scribes, class notes, arrangements for accommodations and transportation, and other services as appropriate. For more information, contact the director for student affairs.

Career Services Office

The Office for Career Services offers career counseling, employment resources, and networking opportunities to assist students and alumni in expanding their employment prospects. The office invites numerous organizations to campus to present information sessions and to participate in the fall and spring Career Fair. Organizations are invited to post jobs, internships, and fellowships and to review electronic resume/CV books for potential candidates. The career services staff conducts workshops on resume/CV and cover letter writing, job search strategies, and interviewing and negotiating skills and organizes panel discussions featuring public health professionals, including HSPH alumni. Alumni career coaches are also available to assist students with their job search and career planning. Students and alumni have access to current online job postings and to fellowship and internship opportunities. The Career Services Office library contains job listings, resource directories, and other career-related information. Students have the opportunity to network with Harvard graduates through Crimson Compass, an online database of university-wide alumni.

Office of Alumni Affairs

The Office of Alumni Affairs (OAA) acts as a liaison between over 11,000 HSPH alumni and HSPH faculty, students, and administrators. The office develops and implements programs to build the alumni network and serves as a catalyst for connecting students, alumni, faculty, and outside constituencies on local, regional, and international levels.

In addition, OAA works closely with the Offices of Career Services, Student Services, and Educational Programs, as well as individual academic departments, to provide input into curricula, locate and facilitate practice placements, and act as a resource for possible career opportunities. The Office of Alumni Affairs also works with the HSPH Alumni Association and the Alumni Council, the association's elected representative body, to organize educational and networking events in the United States and abroad. In 2009–10 the office will be working with the HSPH Alumni Council to build an online community to help facilitate connections between HSPH students, faculty, and alumni.

Office of Diversity

The HSPH Office of Diversity was created to initiate and support activities that increase diversity and promote cultural competency among members of the HSPH community. The office assists with recruitment initiatives, hosts or co-sponsors cross-cultural educational activities and events, and participates in activities that represent the school's diversity agenda within HSPH and the university and nationally. The office is also an informal gathering place for students, staff, and other members of the community.

Student Organizations

The HSPH Student Government includes elected and appointed representatives from each department, from the MPH program, and from the Division of Biological Sciences. The Student Government meets regularly to discuss issues and plan activities related to student life at HSPH. The organization also provides a mechanism for working with members of the school's faculty and administration on schoolwide issues, for sponsoring seminars and other educational programs, for organizing social activities, and for arranging for student representation on several of the school's faculty committees. The Student Government frequently sponsors or cosponsors collaborative activities, such as toy drives, with the school and the neighboring community.

There are numerous student organizations at HSPH geared toward the interests of specific constituencies, including the Spanish Speaking Committee; the Asian Club; the Lesbian, Gay, Bisexual, and Transgender Association; the Jewish Students Association; the Muslim Student Group; the Christian Fellowship; the Health Policy Forum; and Reproductive Health and Rights.

Harvard International Office

During the 2008–09 academic year, about 33 percent of HSPH students came from outside the United States. The experiences that international students bring to the school lend an important dimension to the academic programs and add to the richness of the environment. International students organize many cultural events at the school and participate in the annual International Night talent show.

In addition to the programs provided by the Office for Student Affairs, the Harvard International Office, located on the Cambridge campus, offers a variety of services to students from abroad, including orientations, newsletters, and cross-cultural workshops. One program, the Friends of International Students, matches students with a person or family who will welcome them and ease their transition to the United States. An international student adviser from the Harvard International Office holds biweekly office hours at HSPH to assist students with visa matters and to advise them on immigration regulations and other issues.

Child Care Facilities and Work/Life Resources

There are a number of child care facilities located near the Longwood and Cambridge campuses. Referrals and information are provided by the Harvard University Office of Work and Family. Arrangements should be made as early as possible, as facilities are quickly filled. The HSPH work/life liaison can provide additional information on university- and school-sponsored support services and resources for students and their families.

Contact Information

For more information about student services, please contact Stanley Hudson, associate dean for student services, 677 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-4703
Fax: 617-432-2009

For more information about student affairs or students with disabilities, please contact Andy Eisenmann, director for student affairs, 677 Huntington Avenue, Boston, MA 02115.
Phone: 617-432-1036
Fax: 617-432-3879
Web: http://www.hsph.harvard.edu/studentaffairs

For more information about Shattuck House and other housing, please consult http://www.hsph.harvard.edu/student-life/housing

For more information about Harvard Real Estate Services, please consult http://www.hres.harvard.edu/rre.html

For more information about career services, please contact Peter Crudele, director of career services, 677 Huntington Avenue, Boston, MA 02115, or visit the office website.
Phone: 617-432-1034
Fax: 617-432-3879
Web: http://www.hsph.harvard.edu/careers

For more information about services offered by the Office of Diversity, please contact Dale Trevino, director of diversity programs, 33 Wigglesworth Street, Boston, MA 02120.
Telephone: (617) 384-5411
Email: dtrevino@hsph.harvard.edu

For more information about services offered by the Harvard University International Office, please contact Maria Hernandez, adviser to foreign students and scholars, Harvard International Office, 1350 Massachusetts Avenue, Cambridge, MA 02138.
Phone: 617-495-2789
Fax: 617-495-4088

For more information about child care centers in the area, please contact the Office of Work/Life Resources.
Phone: 617-495-4100

For more information on services, resources, and programs for students and their families, please contact Ronnie Mae Weiss, work/life liaison.
Phone: 617-432-7448
Email: rweiss@hsph.harvard.edu

Academic Officers of the Harvard School of Public Health

Julio Frenk, MD, MPH, MA, PhD, Dean of the Faculty of Public Health

David J. Hunter, MB, BS, MPH, SD, Dean for Academic Affairs

Michael J. Grusby, PhD, Senior Associate Dean for Academic Affairs

Bernita L. Anderson, MA, Associate Dean for Faculty Affairs

Karen M. Emmons, MA, PhD, Associate Dean for Research

Stanley G. Hudson, MA, MBA, Associate Dean for Student Services

Nancy M. Kane, MBA, DBA, Associate Dean for Educational Programs

David A. Shore, PhD, Associate Dean for Continuing Professional Education

Nancy Turnbull, MBA, Associate Dean for Educational Programs

Roberta Gianfortoni, MA, Assistant Dean for Professional Education

Online Resources

A wealth of HSPH information can be accessed at http://www.hsph.harvard.edu. This site includes updated course, faculty, and educational information and school news. Information about Harvard's other faculties can be found at http://www.harvard.edu.

HSPH Catalog 2009–10

Every effort is made to ensure the information contained in this catalog is accurate at the time of publication. However, the Harvard School of Public Health reserves the right to make changes without notice in tuition and fees, admission and degree requirements, courses of instruction, faculty, and other information contained herein. These changes will govern all students, including those who matriculated prior to the changes coming into effect.

Editor: Elizabeth Jones

Graphic design: Cynthia Frawley

Publications coordinator: Kate Cole

Photography: Dan Bersak, Suzanne Camarata, Richard Chase, Kent Dayton, Grant Faint/Getty Images, Paul Farmer, Richard Feldman, Andrew Fox/Corbis, Liza Green, Naomi Odell, Roger Perales, Winnie Yip

Nondiscrimination Policy

As a matter of policy, law, and commitment, the Harvard School of Public Health does not discriminate against any person on the basis of race, color, sexual orientation, gender identity, religion, age, national or ethnic origin, political beliefs, veteran status, or handicap in admission to, access to, treatment in, or employment in its programs and activities. The following person has been designated to handle inquiries about nondiscrimination programs: Christine Ciotti, associate dean for human resources, Office of Human Resources, 677 Huntington Avenue, Boston, MA 02115. Inquiries about the application of nondiscrimination policies concerning race, color, national origin, age, sex, or handicap may also be referred to the Regional Director, Office for Civil Rights, U.S. Department of Education, J. W. McCormack POCH, Room 222, Post Office Square, Boston, MA 02109.

Disabilities

The university, in accordance with its obligations under the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973, does not discriminate against qualified individuals with disabilities in admission or access to programs and activities. The Office for Student Affairs assists all students with learning, manual, mobility, hearing, visual, and other disabilities.

Religious Holidays

According to Chapter 151c, Section 2B, of the General Laws of Massachusetts, any student in an educational or vocational training institution, other than a religious or denominational training institution, who is unable, because of his or her religious beliefs, to attend classes or to participate in any examination, study, or work requirement on a particular day shall be excused from any such examination or requirement which he or she may have missed because of such absence on any particular day, provided that such makeup examination or work shall not create an unreasonable burden upon the school. No fees of any kind shall be charged by the institution for making such opportunity available to the student, and no adverse or prejudicial effects shall result to any student for availing himself or herself of these provisions.

Campus Security

In compliance with the Student Right-to-Know and Campus Security Act of 1990, the Harvard University Police Department publishes an annual security booklet entitled *Playing It Safe*. The booklet describes Harvard's security policies, provides statistical information on the occurrence of crime on campus, and outlines some of the counseling programs the university offers. Students may obtain a copy of this booklet from the HSPH Admissions Office, 158 Huntington Avenue, Boston, MA 02115 (phone: 617-432-1031; web: http://www.hupd.harvard.edu).

Voter Registration

Massachusetts state law, as set forth in Chapter 51, Section 42E (Section 17 of Chapter 475 of the Acts of 1993), requires educational institutions to make available affidavits of voter registration. Eligible students may register to vote at registration, and mail-in registration affidavits are available from the Registrar's Office. Students from other states who desire to vote in a state other than Massachusetts may use the federal mail-in affidavit of voter registration or a mail-in form supplied by the state. These students must contact the appropriate state election official to receive the state form or may contact the Massachusetts Elections Division, Room 1705, McCormack Building, One Ashburton Place, Boston, MA 02108, for a federal form.

Accreditation

The Harvard School of Public Health is accredited by the Council on Education for Public Health.

FACULTY INDEX

Acevedo-Garcia, Dolores, 50
Adami, Hans-Olov, 22
Allen, Jennifer D., 51
Ascherio, Alberto, 22, 45
Atkins, Elisha H., 17
Austin, S. Bryn, 51
Ayanian, John Z., 37
Baccarelli, Andrea, 17
Baicker, Katherine, 36
Bärnighausen, Till W., 30
Bates, David W., 37
Behar, Samuel M., 41
Bellinger, David C., 17
Berkman, Lisa F., 22, 30, 50
Berman, Peter A., 31
Berwick, Donald M., 37
Betancourt, Theresa S., 30
Betensky, Rebecca A., 8
Biddinger, Paul D., 37
Blacker, Deborah, 22
Blatt, Robin J.R., 51
Blendon, Robert J., 36
Bloom, Barry R., 30, 40
Bloom, David E., 30
Bloomberg, Mark A., 37
Bossert, Thomas J., 30
Brain, Joseph D., 16
Brennan, Troyen A., 37
Breteler, Monique M. B., 23
Briscoe, John, 16
Brown, Mary Jean, 51
Bruderlein, Claude, 31
Buka, Stephen L., 51
Buring, Julie E., 22
Burleigh, Barbara, 40
Burstein, Jonathan L., 31
Butler, James P., 16
Cai, Tianxi, 8
Camargo, Jr., Carlos A., 22
Campbell, Mark J., 37
Campbell, Paul H., 31, 36
Campos, Hannia N., 45
Canning, David J., 31
Conway, James B., 37
Cash, Richard A., 31
Castro, Marcia C., 31
Catalano, Paul J., 8
Chan, Kin-Wei Arnold, 23
Cho, Eunyoung, 45
Choi, Augustine M. K., 17
Christiani, David C., 16, 22
Christophi, Costas A., 17
Cohen, David J., 37
Cohen, Jessica Lee, 31
Cohen, Michael H., 37
Cohen, Theodore H., 23
Colditz, Graham A., 23
Connolly, Gregory N., 50
Conway, James B., 37
Cook, E. Francis, 22
Cook, Nancy R., 23
Coull, Brent A., 9
Cramer, Daniel W., 23
Crocker, Allen C., 51
Crosby, Guy, 45
Curhan, Gary C., 23
Daniels, Norman, 31
Davis, Roger B., 9
DeGruttola, Victor G., 8
Demokritou, Philip K., 17
Demple, Bruce F., 25
Dennerlein, Jack T., 16
Devaux, Deborah, 37
DeVivo, Immaculata, 23
Dicker, Richard C., 23
Dockery, Douglas W., 16, 22
Dominici, Francesca, 9
Doria, Alessandro, 23
Douglas, Chester W., 23
Drazen, Jeffrey M., 17
Duggan, Christopher P., 45
Duraisingh, Manoj T., 40
Dwyer, Johanna T., 51
Earle, Craig C., 37
Earls, Felton J., 50
Eisen, Ellen A., 17
Emmons, Karen M., 50
Epstein, Arnold M., 36
Essex, Myron (Max), 40
Evans, John S., 16
Ezzati, Majid, 16, 31
Fawzi, Wafaie W., 22, 31, 45
Field, Alison E., 23
Fink, Günther, 31
Finkelstein, Dianne M., 9
Fitzmaurice, Garrett, 9
Fortune, Sarah M., 40
Frazier, A. Lindsay, 23
Fredberg, Jeffrey J., 16
Freedberg, Kenneth A., 37
Frenk, Julio, 31
Fung, Teresa T., 45
Ganz, Michael L., 51
Gauvreau, Kimberlee, 9
Gawande, Atul A., 37
Gazelle, G. Scott, 37
Gaziano, Thomas A., 37
Gelber, Richard D., 9
Gelman, Rebecca S., 9
Gillman, Matthew W., 45
Gilman, Stephen E., 22, 50
Giovannucci, Edward L., 22, 45
Glimcher, Laurie H., 41
Glymour, Maria, 50
Glynn, Robert J., 9
Godleski, John J., 17
Gold, Diane R., 17
Goldberg, Marcia B., 41
Goldfeld, Anne E., 41
Goldie, Susanne J., 36
Goldman, Roberta E., 51
Goldman, Rose H., 17
Goldmann, Donald A., 41
Gortmaker, Steven L., 50
Gottlieb, Barbara, 51
Grandjean, Philippe, 17
Gray, Robert J., 9
Greenes, Robert A., 37
Grodstein, Francine, 23
Grusby, Michael J., 41
Gruskin, Sofia M., 31
Haas, Jennifer S., 51
Halperin, Daniel T., 31
Hammitt, James K., 36
Hankinson, Susan E., 23
Hanna, Steven R., 17
Harlow, Bernard L., 23
Harrington, David P., 9
Hartl, Daniel L., 41
Hauser, Russ B., 16, 22
Helm, David T., 51
Hemenway, David, 36
Hernán, Miguel A., 22
Hernández-Díaz, Sonia, 22
Herrick, Robert F., 17
Hetz, Claudio A., 41
Hide, Winston, 9
Hill, Allan G., 31
Hill, Kenneth, 31
Hirsch, Martin S., 41
Hofman, Albert, 23
Holmes, Michelle D., 23
Homer, Charles J., 51
Horng, Tiffany, 25, 41
Hotamisligil, Gökhan S., 25, 45
Houseman, E. Andrés, 9
Hsiao, William C., 31, 36
Hsieh, Chung-Cheng, 23
Hu, Frank B., 22, 45
Hu, Howard, 17
Hughes, Michael D., 9
Hunink, Maria G. M. (Myriam), 37
Hunter, David J., 22, 45
Huttenhower, Curtis, 9
Javitch, David, 37
Jha, Ashish K., 36
Joshipura, Kaumudi J., 23
Kachalia, Allen B., 37
Kafatos, Fotis C., 41
Kales, Stefanos (Stephen) N., 17
Kane, Nancy M., 36
Kanki, Phyllis J., 41
Kapiga, Saidi H., 31
Kasten, Jack, 36
Katz, Jeffrey N., 17, 23
Kawachi, Ichiro, 50
Killingsworth, Cleve L., 37
Kim, Jane J., 36
Kindlon, Daniel J., 51
Kleinman, Lawrence C., 51
Kobzik, Lester, 17
Koenen, Karestan C., 22, 50
Koh, Howard K., 36
Koutrakis, Petros, 17
Kraft, Peter, 9, 22
Krieger, Nancy, 51
Kubzansky, Laura D., 51
Kuntz, Karen M., 37
Kurth, Tobias, 23
Laden, Francine, 17, 22
Lagakos, Stephen W., 9
Lagiou, Pagona, 23
Laird, Nan M., 9
Lamstein, Joel H., 31
Lange, Christoph, 9
Lange, Nicholas T., 9
Larsen, Ulla M., 31
Lauterbach, Karl W., 37
Lazzarini, Zita, 37
Leamon, Tom B., 17
Leaning, Jennifer, 31
Leape, Lucian L., 37
Lee, Chih-Hao, 25
Lee, I-Min, 23
Lee, Thomas H., 37
Lee, Tun-Hou, 41
Levins, Richard, 31
Levin-Scherz, Jeffrey, 37
Levy, Jonathan I., 17, 36
Li, Yi, 9
Liang, Matthew H., 37
Lieberman, Ellice S., 51
Lieu, Tracy A., 37
Lin, Xihong, 9
Lipsitch, Marc, 22, 41
Litvak, Eugene, 37
Liu, Jun, 9
Liu, Xiaole (Shirley), 9
Liu, Yuanli, 31
Lo, Clifford W., 45
Lockman, Shahin, 41
Lok, Judith J., 9
Long Sieber, Nancy C., 17
Lu, Chensheng (Alex), 17
Lu, Quan, 17, 25
Lucas, Adetokunbo O., 31
Ludwig, David S., 45
MacCracken, Linda, 37
Maclure, K. Malcolm, 23
Mahal, Ajay, 31
Maher, Edward F., 17
Makris, Konstantinos, 17
Manning, Brendan D., 25
Manson, JoAnn E., 23
Mantzoros, Christos S., 17
Marcus, Leonard J., 36
Marks, Stephen P., 31
Marlink, Richard G., 41
Marmot, Michael G., 51
Marti, Matthias, 41
McCormick, Marie C., 51
McDonough, John E., 37
McIntosh, Kenneth, 41
Mehta, Cyrus R., 9
Mello, Michelle M., 36
Michaud, Dominique S., 23
Michels, Karin B., 23
Miller, Matthew J., 36
Milner, Danny A., 41
Milton, Donald K., 17
Missmer, Stacey A., 23
Mitchell, James R., 25
Mitchell, Marc D., 31
Mittleman, Murray A., 23
Mizgerd, Joseph P., 17
Molnar, Beth E., 51
Monath, Thomas P. C., 41
Moseley, George B., 37
Moulton, Benjamin W., 37
Mozaffarian, Dariush, 23
Mucci, Lorelei A., 23
Murphy, Jane M., 23
Murphy, Robert L., 41
Murray, Christopher J. L., 31
Murray, Megan B., 22
Muskavitch, Marc A. T., 41
Muti, Paola, 23
Nardell, Edward A., 17, 41
Nelson, Charles A., 51
Neuberg, Donna S., 9
Newhouse, Joseph P., 36
Nobel, Jeremy J., 37
Normand, Sharon-Lise T., 9
Norris, Gregory, 17
O'Brien, Stephen J., 41
Olsen, Sjúrdur F., 45
Orav, E. John, 9
Ozonoff, Alexander J., 9
Paciorek, Christopher J., 9
Pagano, Marcello, 9
Palfrey, Judith S., 51
Palmer, R. Heather, 36
Parmigiani, Giovanni, 9
Pauls, David L., 23
Perry, Melissa, 17
Peters, Annette, 17
Peterson, Karen E., 45, 51
Pliskin, Joseph S., 37
Pojasek, Robert B., 17
Porter, Janet E., 37
Price, Alkes L., 9, 22
Prosser, Lisa A., 37
Prothrow-Stith, Deborah B., 37
Puhy, Dorothy E., 37
Quackenbush, John, 9
Quigley, Karen M., 37
Rahman, M. Omar, 31
Reede, Joan Y., 51
Reich, Michael R., 31
Resch, Stephen C., 37
Rich, Michael O., 51
Rich-Edwards, Janet W., 23
Ridker, Paul M., 23
Rimm, Eric B., 23, 45
Rivenson, Howard L., 37
Roberts, Marc J., 31, 37
Robins, James M., 9, 22
Rogers, Christine A., 17
Rosenthal, Meredith, 37
Rosner, Bernard A., 9
Rotnitzky, Andrea, 9
Rubin, Eric J., 41
Rudd, Rima E., 51
Rudnick, Stephen N., 17
Ryan, Edward T., 41
Ryan, Louise M., 9
Sacks, Frank M., 45
Sahney, Vinod K., 37
Salomon, Joshua A., 31
Samuels, Ronald C., 51
Santangelo, Susan L., 23
Satoskar, Abhay R., 41
Schaumberg, Debra A., 23
Schernhammer, Eva S., 23
Schneeweiss, Sebastian, 23
Schneider, Eric C., 37
Schoenfeld, David A., 9
Schwartz, Joel D., 17, 22
Schwartzman, Armin, 9
Seage, George R., 22
Seeger, John D., 23
Seielstad, Mark T., 23
Sen, Gita, 31
Shapiro, Roger L., 41
Shine, James P., 17
Shonkoff, Jack P., 51
Shore, Stephanie A., 17
Siebert, Uwe, 37
Siegrist, Richard B., 37
Silverman, Jay G., 51
Singer, Daniel E., 23
Singer, Sara J., 37
Smith, Thomas J., 17
Smith-Warner, Stephanie A., 22, 45
Smoller, Jordan W., 23
Sodroski, Joseph G., 41
Sorensen, Glorian, 51
Speizer, Frank E., 17
Spengler, John D., 17
Spiegelman, Donna L., 9, 22
Stampfer, Meir J., 22, 45
Stanley, Kenneth E., 9
Stoto, Michael A., 9
Studdert, David M., 37
Subramanian, S. V., 51
Suh, Helen H., 17
Swartz, Katherine, 37
Swenson, Norma M., 51
Tamimi, Rulla M., 23
Tchetgen, Eric J., 22
Testa, Marcia A., 9
Tieszen, Lisa, 51
Trichopoulos, Dimitrios V., 22
Tronick, Edward Z., 51
Tschumperlin, Daniel J., 17
Tsuang, Ming T., 23
Turnbull, Nancy, 37
Tworoger, Shelley S., 23
Van Dam, Rob M., 23, 45
VanderWeele, Tyler J., 22
VanRooyen, Michael J., 31
Verrier, Richard L., 17
Villamor, Eduardo, 45
Viswanath, Kasisomayajula, 51
Wagner, Gregory R., 17
Walker, Alexander M., 23
Walker, Deborah K., 51
Walker, Bruce D., 41
Walker, W. Allan, 45
Wang, Molin, 9
Ware, James H., 9
Weeks, Jane C., 37
Wegman, David H., 17
Weller, Peter F., 41
Wei, Lee-Jen, 9
Weinstein, Milton C., 9, 37
Weiss, Scott T., 17
Weisskopf, Marc G., 17, 22
Weissman, Joel S., 37
Wessling-Resnick, Marianne, 25, 45
White, Laura Forsberg, 9
Wikler, Daniel, 31
Willett, Walter C., 22, 45
Williams, David R., 51
Williams, Paige L., 9
Wilson, Mary E., 31
Wirth, Dyann F., 40
Wolf, Dieter A., 25
Wright, Robert O., 17
Wright, Rosiland J., 17
Wypij, David, 9
Wyshak, Grace, 9, 31
Xu, Xin, 17
Yip, Winnie Chi-Man, 31
Yuan, Guocheng, 9
Zalloua, Pierre A., 17
Zavras, Athanasios I., 23
Zelen, Marvin, 9
Zhang, Shumin, 23

HSPH ACADEMIC CALENDAR, 2009–10

2009

July 1	Registration for summer programs
July 2	Summer Program in Clinical Effectiveness and Summer Session for Public Health Studies begin
July 2–24	Summer 1 term
July 3	Independence Day, a holiday (observed)
July 27–August 14	Summer 2 term
August 16–24	Professional Communication Seminar
August 24	Fall semester check-in for new students
August 24–28	Orientation for new students
September 2	Fall 1 term begins
September 7	Labor Day, a holiday
October 12	Columbus Day, a holiday
October 23	Fall 1 term ends
October 26	Fall 2 term begins
November 11	Veterans Day, a holiday
November 26–27	Thanksgiving recess
December 15	Final deadline for application to all doctor of science (SD), doctor of public health (DPH), master of occupational health (MOH), and most master of science (SM) programs; deadline for application to master of public health (MPH), and SM in health care management programs in the priority admission cycle
December 18	Fall 2 term ends
December 21–January 1	Winter recess

2010

January 1	New Year's Day, a holiday
January 4	WinterSession* begins
January 8	Final deadline for application to MPH program
January 18	Martin Luther King, Jr., Day, a holiday
January 22	WinterSession ends
January 25	Spring 1 term begins
February 15	Final deadline for application to the SM in health care management program
February 15	Presidents Day, a holiday
March 12	Spring 1 term ends
March 15–19	Spring recess
March 22	Spring 2 term begins
May 14	Spring 2 term ends
May 27	Commencement
May 31	Memorial Day, a holiday

*WinterSession is a special academic term at HSPH offering opportunities for creativity and innovation in learning and teaching. Credit and noncredit courses and activities for WinterSession, as well as relevant school and departmental policies, are listed at the following website: http://www.hsph.harvard.edu/registrar/WinterSession/index.shtml

FSC Mixed Sources
Product group from well-managed forests, controlled sources and recycled wood or fiber
www.fsc.org Cert no. SW-COC-002376
© 1996 Forest Stewardship Council
10%

HARVARD SCHOOL OF PUBLIC HEALTH
677 Huntington Avenue
Boston, MA 02115